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Transfusing new blood

The Government's decision just before Christmas to give the universities enough money to recruit an additional 230 "new blood" lecturers is a good idea and - in a severely qualified sense - a generous one. But it is also an idea that is difficult to implement in a way that is sufficiently coherent to prevent the whole point of the initiative being lost yet adequately flexible to avoid discordant and even harmful side effects in the universities.

This difficulty is part political, part managerial. From the Government's point of view, and presumably those of the University Grants Committee and the research councils which have endorsed the scheme, the intention must be to segregate the "new blood" initiative from the general policy of cuts. For them the two issues must remain separate, on the one hand the contraction of the universities in progress since 1981, which inevitably requires a significant reduction in the number of university teachers, and on the other hand the maintenance of the system's academic vitality which just as inevitably requires the recruitment of a limited number of new academic staff.

For ministers this separation is essential because otherwise their policy of taking, a lot, with one hand and giving, a little, with the other would appear even more indefensible. For the managers of the system and the leaders of institutions it is at any rate desirable because it offers them, as proxies for government, powerful levers of change within universities, and because only on these terms would the Government agree to provide the very welcome extra money.

For these reasons the Association of University Teachers is determined that the two issues should be taken together. They, and all opponents of the Government's harsh higher education policy, insist that ministers must accept full responsibility for the

consequences of this policy and should not be allowed to deflect the blame for any loss of the universities' academic vitality by a small-scale and cosmetic exercise such as the "new blood" initiative. Nor are they anxious to allow vice chancellors and other institutional managers greater power by offering them both the stick of contraction/restructuring and the carrot of "new blood".

These important political differences in turn have to be seen against the background of the academic profession as it has grown up since Robbins, its power within the universities, and the universities' relationship with society. The facts are well rehearsed - a "bulge" of teachers recruited in the expansionary years, first the hardening of and then the attack on academic tenure, the gradual development of a semi-proletarianized penumbra of research workers and contract teachers, even, some would argue, the growth of a more self-conscious intellectual located most prominently in social science. The "new blood" initiative is a small part of a large picture.

The managerial difficulties of the "new blood" scheme are easier to describe but probably as difficult to solve. At their root is an ambiguity of purpose. In its letter to universities the UGC emphasized that the new posts would be normal academic appointments and, although "their primary role in the early years will be to contribute substantially to research", universities should not be deterred from appointing "the best candidate by too rigid an adherence to the research prospectus in their application". The message seems to be: treat these posts as long-term additions to the academic staff of the university, not as short or medium-term appointments to service specific research needs.

Yet the mechanism adopted to de-

cide which universities should be allowed "new blood" appointments is not really consistent with this intention. The UGC is very much a post office. The real work of selection is being undertaken by the research councils. They are approaching this task very much in the spirit (and with the system) in which they approach applications for research grants - that is, for specific projects that have a fixed term. How this rather precise method of selection is going to allow for the latitudinarianism encouraged by the UGC in its letter is far from clear. Yet to encourage the research councils to abandon their habitual precision would be to ask them to devalue their expertise or to lower their standards.

This chronic managerial difficulty is a symptom of the larger drive to centralize decision-making in higher education. However much attention is paid to the conventions of piety, it is clear that there is little confidence in the ability, or possibly the will, of individual institutions to make sensible decisions about the future that add up to a coherent pattern. That is why we have research councils making round-pipe, square-hole decisions about hiring new lecturers, and why we have the National Advisory Body second-guessing the priorities of polytechnics, colleges, and local authorities. There is probably little point in adopting too pure or fundamentalist an opposition to this trend. For it transcends all political boundaries.

There is probably more point in subjecting the process of central decision-making to careful scrutiny. Will it, in practice and in detail, produce better results than the archaic anarchy of institutions? The political and managerial difficulties encountered already suggest that this will sometimes be hard to prove.

The AUT's silent majority

Two opposite reactions will probably be provoked by the survey of public opinion carried out by Gallup for the Association of University Teachers, as the AUT's contribution to this week's Educational Opportunities Campaign. This survey showed that Britain should spend more on education and the health service and less on defence.

The first cynical reaction will be that people will always tell pollsters that they are against sin, or its equivalent. What matters is not what people say but what they do, or in this case vote. After all polls also show strong support for the Conservatives who have made no secret of the fact that their expenditure priorities are rather different from those of the AUT. The same cynics may also comment on the phrasing of the questions in the Gallup poll, the drift of which could only be resisted by

The second and more thoughtful reaction to the poll will be to reflect on why it is so difficult to translate public opinion into concrete and sustainable action. After all, the trouble with silent majorities is just that, their silence. There are alternative interpretations of the more pessimistic view that the public supports higher education but supports other things more. The other, more optimistic view is that it is ultimately remediable, is

that the public, although enthusiastic about the potential of higher education, does not have sufficient faith in the ability of higher education as it is at present organized to realize that potential.

So it may be that the AUT's poll has disturbing implications for both the Government, which has been made painfully aware that the public's support for higher education is not as vestigial as it hoped, and for the interest groups in the system which, despite as well as because of their best intentions, are inevitably seen as the defenders of a conservative status quo. For although there is plenty of evidence in the AUT's poll that the public does not share the Government's enthusiasm for cutting higher education, there is no evidence to support the contrary, complacent view that they are thereby endorsing the system as it is.

Commonwealth interchange

The gap between rhetoric and reality has always been worryingly wide in the Commonwealth, though whether this gap is evidence of the twitches of envy and sentiment or the creative tensions of diversity that embraces North and South, white and black, rich and poor, has depended on the observer. Certainly there has been a strong case for regarding higher education links within the Commonwealth as more solid than most, despite discriminatory policies (towards overseas students (Britain) or protectionist policies towards the employment of foreign teachers (Canada)).

Yet even in higher education the limits of Commonwealth cooperation have to be constantly remembered. For any attempt to stretch these

limits too far is as likely to lead to their dissolution as to their strengthening. It is for this reason that rather than a concept of "interchange" is a better context in which to encourage academic cooperation between the member states of the Commonwealth than the more precise category of "exchange". In many instances the potential for organized exchange may be slight when the possibilities for interchange are much greater. So it would be unfortunate if Commonwealth cooperation within the narrow limits of "exchange" were to be seen as a model for or even a substitute for the theme of interchange, rather than a change was chosen for our special

Commonwealth pages (pages 11-13). Yet this broadening of the scope of academic cooperation within the Commonwealth should not be seen as a dilution of its purposes. This summer's Commonwealth Universities Congress in Birmingham is a symbol of the continuing importance of these links to the institutions and states of the Commonwealth. The congress themes - the social consequences of technological innovation, the contribution of universities to integrated rural development, university/industry relations, the development and transfer of technology and continuing education - are a reminder of the continued relevance and vitality of such links.

Laurie Taylor



"Didn't see you on the demonstration."
"What's that?"
"The Day of Action."
"Oh yes."
"Were you in the north-east AUT group?"
"Not exactly."
"You didn't get mixed up with the ASTMS contingent, did you? Like we did last year?"
"Not really."
"Anyway, you got there in time for the Tower Hill rally and the march down Fleet Street."
"Not quite."
"Ah, you went straight to Central Hall, Westminster for the big speeches."
"Well . . ."
"What then?"
"Well, quite honestly I've had a bit of a tickle in the old throat since the beginning of the week and might be a good chance to shake it off once and for all."
"You stayed in bed all day?"
"Yes, more or less. And you?"
"Oh, I was up and about."
"What - Tower Hill, Fleet Street, Westminster?"
"Not exactly."
"What then?"
"Well, to tell you the truth, we've been having a bit of trouble with the garage roof after all the rain and what with all the lectures cancelled it seemed a chance to get the ladders out."
"Very sensible."
"I mean I was quite happy to go along last year."
"Oh I could see that! I remember you chanting 'Joseph Out! Joseph Out!' all the way down Whitehall!"
"Oh yes. And what about you? Linking arms with Kinnock and trying to get him to sing the Red Flag?"
"I'd nearly forgotten."
"I mean, as I say, that was alright last year. When there were definite rumours about one's own job."
"When it was all more focused."
"Exactly. But now that the specific issue is more or less sorted out one begins to wonder about the motives of some of those who're still making all the hub and bother."
"Much my feelings. Probably a few professional troublemakers among them."
"Mind you, there is one thing that's still worrying me a little."
"Yes?"
"Do you think there'd be any one else who'd have any use for our banner?"

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LARGER THAN LIFE: Cyril Smith, Liberal MP for Rochdale, Lancashire, finds time to woo some of his constituents by posing for the Saturday morning life class at Rochdale College of Art. Mr Smith, who brought along his bulging briefcase and newspaper, obviously felt relaxed enough about his image to pose in his carpet slippers.

Help for jobless expected soon

An initiative on education for unemployed adults is likely to be announced soon by the Department of Education and Science, in conjunction with its decision on a successor body for the Advisory Council for Adult and Continuing Education. A link between ACCE's future and provision for the unemployed, played by under-secretary of state for education and science Mr William Shilton in a letter to a Conservative MP has been confirmed by the DfES.

Mr Shilton's letter points out that several reports have recommended a central agency. "The decision on whether there should be some form of successor body to ACCE, and if so what form it should take, is obviously very relevant to our consideration of the report on the unemployed" he wrote.

The decision comes as the draft Manpower Services Commission report on adult training practically rules out the inclusion of unemployed adults in its £280m strategy, thereby putting that particular ball back in the DES court.

The MSC's discussion paper, due out at Easter, says an economic approach to adult training "suggests more effort should be put into training and retraining those already in employment or about to start a new job. . . . Other ways are needed to give effective help to the unemployed."

Ministers are still undecided between three options: no replacement for ACCE; another temporary body but with development powers; or a series of ad hoc committees. Leader back page

Thatcher stalls on SSRC man

by Paul Flather

The Prime Minister's Office is holding up the appointment of a senior civil servant and former head of the Ministry of Defence to the Social Science Research Council on the grounds that he may have "more important work to do".

Sir Frank Cooper, who retired at the end of last year after almost seven years as permanent secretary at the Ministry of Defence, has agreed in principle to sit on the SSRC.

But an announcement last week from the Secretary of State for Education, Sir Keith Joseph, listed five names to fill the six SSRC places vacant since last October, and significantly Sir Frank's name was omitted.

Mr Michael Posner, the SSRC chairman, is holding Sir Frank in very high esteem as a man with "a breadth of experience and greater intelligence" and is very keen to get him on the council.

But Mrs Margaret Thatcher, the Prime Minister, is also very keen on Sir Frank, and in recent months his name has been linked to various key posts as they have cropped up, including Sir Derek Rayner's former post advising on Civil Service efficiency, and as a special defence adviser inside the Prime Minister's Office.

Sir Frank has built a reputation as tough, rumbustious, and efficient, with spells in the Civil Service Department, the Northern Ireland Office, and the MoD. It is understood he has turned down recent key offers, largely because he wanted a quieter life. Sir Frank is currently abroad.

Three of the new SSRC appointments, Mr Ian Byatt, deputy chief economic adviser at the Treasury, Philip Levy, professor of psychology at Lancaster University, and James Durbin, professor of statistics at London School of Economics, were revealed in *The Times* in January.

They are joined by Mr Andrew Noble, joint managing director of Debenhams, and Professor Robert Steele, former principal of the University College of Swansea.

Joseph orders left-wing bias inquiry at PNL

by Staff Reporters

Sir Keith Joseph, Secretary of State for Education and Science, has ordered an investigation into allegations of left-wing bias in the sociology and applied social studies schools of North London Polytechnic.

The accusations were made in a dossier compiled by a retiring member of staff sent to Sir Denis Rooke, chairman of the Council for National Academic Awards. A copy was sent to Sir Keith, who met senior officials of the Council for National Academic Awards last week to discuss the case.

Although the matter was raised at this week's CNA full council meeting, no action was ordered. By coincidence, a CNAA visiting party was due at the polytechnic today to carry out an institutional review. Dr Edwin Kerr, chief officer of the CNAA, who was in Australia when the complaint was received, said this week of the meeting with Sir Keith: "We told him that certain steps were under discussion between the council and the polytechnic which, due to their sensitive nature, I cannot reveal."

The polytechnic was already in the limelight because of a series of student occupations protesting at the planned closure of an annex housing a librarianship course. It was at the centre of rows over alleged bias in the 1970s, but has not been a recent centre of controversy.

Dr David MacDowell, the PNL director, was not available for comment this week. It is understood that no final decision has been made on the polytechnic's response to the allegations, although there is pressure for an internal inquiry.

Mr Noel Parry, who took over as head of the sociology department in 1978, said: "I have not seen the allegations myself and until I am notified by the director what the position is I shall not be able to do much about it." Recalling similar allegations in the mid-1970s Mr Parry said: "The CNAA and the polytechnic have been sensitive to this issue - since it was raised a long time ago. Obviously we have been alert ever since."

The dossier was compiled by a former member of the sociology school, who is taking early retirement after a prolonged period of sick leave.

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Two controversial plans to shake up polys and universities meet different fates

NAB fudges the future

by John O'Leary

Proposals for a long-term strategy for colleges and polytechnics were held up this week by the board of the National Advisory Body despite a restraining which placed much less emphasis on the controversial issue of two-year courses.

A small group of board members will now make a second set of amendments before the plan is accepted before NAB again in May. If accepted, a wide-ranging consultation exercise will begin.

The draft considered by the board raised a number of further options for maintaining access to higher education at a time of reduced funding. But the suggestion of a switch to two-year courses was retained for the first time, the possibility of a change in such courses was rejected.

A large proportion of home-based part-time students, together with short courses, are measures designed to meet the conflict of maximum access and limited resources.

Quirk tenure plan makes quiet progress

by Ngalo Crequer

Heads of colleges at London University agreed this week to circulate another discussion document which examines ways of removing tenure for new staff.

The paper asks employing bodies within the university to comment on how statutes could be changed to include a redundancy clause. In particular, it is proposed that any definition of what constitutes redundancy should have to be consistent with the 1978 Employment Protection (Consolidation) Act. This allows dismissal for redundancy if the business on which the employee was working has ceased or diminished.

London's collegiate council was noticeably warmer to this latest move by vice-chancellor, Professor Randolph Quirk, to implement tenure changes. It turned down a similar plan last summer.

But there was also discussion at Monday's meeting of how the "university" should be approached. The Association of University Teachers has said it is amazed at this latest

attack on tenure. The discussion paper will go to the unions under the normal consultative machinery. Professor Quirk said this week he was trying to ensure the flow of young people into the academic profession. "This question is so emotionally tinged people think their own jobs are in jeopardy. The only job in jeopardy are those of their own senior students."

The discussion paper states that although colleagues had raised many significant objections to the proposals on tenure made by the Committee of Vice-Chancellors and Principals, there were still grounds for change.

In proposing that universities should now include provision for redundancy in their statutes, but by leaving them free to issue contracts in whatever form they see fit, Government is placing responsibility for ensuring future flexibility squarely on the shoulders of employing bodies, with all the financial consequences that might follow."

Aberdeen divided over merger issue

by Olga Wojtas
Scottish Correspondent

Aberdeen University academics are split in their reaction to the proposal of a merger between the university, Robert Gordon's Institute of Technology and Aberdeen College of Education.

The university senate has passed a motion proposed by the principal, Professor George McNicol, welcoming the court's initiative in asking the Secretary of State for Scotland and Secretary of State for Education and Science to set up an independent committee to consider the merger.

But a general meeting of the local Association of University Teachers has called on the two secretaries of

state to reject the court's request.

The AUT also condemned the court for proposing an independent committee without prior consultation with staff. The union stressed it was not against a merger, provided it was based on a sound educational rationale, but said proposals on how it could be achieved must come from the three institutions rather than being left to politicians and civil servants.

The senate has not actually declared itself in favour of a merger, but the motion guaranteed it "extensive participation in the evolution of the academic policies involved in this potential union and, should it proceed, in detailed discussion on its implementation".

Members were told the findings of an independent committee would not be binding on the university.

The technicians group of the Association of Scientific, Technical and Managerial Staff at Robert Gordon's has completely rejected any merger among the institutions.

The group's secretary, Mr Andrew Baxter, said an opinion poll had revealed total opposition to the move and this view would be put to the chairman of the college's board of governors.

Any possible merger in Aberdeen must not result in a "super university" which would take over the other colleges, the National Union of Students' Scottish conference decided.

Mr Bob McLean, chairperson of NUS (Scotland) said nobody opposed the idea of change in integration in the tertiary sector. "But we are opposed to the university taking over Robert Gordon's Institute of Technology and the college of education, which would reduce the educational provision, and widen, not narrow the binary divide."

The students condemned the university court for not consulting staff and students in the three institutions before approaching Government ministers. They are to ask who would fund and control the new institution and who would validate its courses, and what the future would be of non-degrees courses currently run by Robert Gordon's.

Special seats plan postponed

by David Jobbins

Changes in the rule book to reserve places for women on key decision-making bodies in the college teachers' union are likely to be shelved for a year on the recommendation of union leaders.

Proposed rule changes calling for three automatic seats for women on the national executive of the National Association of Teachers in Further and Higher Education, together with at least one female representative per branch to the regional councils, are being put to the union's annual conference in Blackpool in May.

But even among women activists support for the move is far from certain.

To avoid a damaging defeat for the proposals at the conference, the union's national executive has accepted a recommendation from the national women's panel to establish a working party to examine the whole issue of positive discrimination in line with established NAFHE policy.

The working group is expected to meet before the union's conference and its creation and a report of its first meeting are likely to form the basis of a proposal from the executive to remit the rule change resolutions.

The working group has been charged with reporting in time for recommendations to be submitted to the 1984 union conference. Union leaders sympathetic to the rule change proposals are anxious that support for their remittance should not be interpreted as opposition.

Disaffiliation from the Campaign for Nuclear Disarmament is almost a foregone conclusion, in the light of the survey of branch attitudes previously reported in *THE TIMES*. The conference follows the spirit of the consultation exercise, NAFHE will earn itself a place in history books as the first teacher union to affiliate to the CND and the first trade union to leave.

But the question of the rule change which made pursuit of political objectives legitimate is far less clear. Reversal will require a two-thirds majority and also even wing union leaders are now suggesting that with the tenor of Government proposals for trade unions it will afford necessary protection for less ardent political campaigns.

TUC tells unions to settle dispute

Mr Len Murray, the TUC general secretary, has appealed to two teacher unions to settle their long-running dispute about which should have the automatic right to represent college lecturers.

His initiative comes shortly before the annual conference of the National Association of Schoolmasters' Union of Women Teachers when union leaders are to report on the progress of discussions with the National Association of Teachers in Further and Higher Education.

Last year the NASUWT warned that unless the agreement between the two unions was renegotiated to allow it to recruit in areas traditionally regarded as a NAFHE preserve, it would be torn up. The NASUWT gave 12 months notice of termination last May and subsequent talks under TUC auspices have failed to resolve the dispute.

The TUC general council has expressed its concern to both unions that they should be seen to be warring over the right to recruit in the disputed area when the Government is seen to be threatening the roots of teacher union organization.

Both sides have indicated they are prepared to continue talking but NAFHE is determined not to surrender its position as the recognized post-school education union.

The NASUWT has sought to make the maximum capital out of NAFHE's litigation with affiliation to the Campaign for Nuclear Disarmament.

CNAA opens channel to NAB Tories deny fresh corruption charges

by Felicity Jones

The Council for National Academic Awards, which approves colleges and their courses, has agreed to cooperate with the National Advisory Body, which was set up to produce a national plan for higher education.

But the council has reserved its right not to answer any questions for reasons of inability, insufficient time or plain unwillingness that the NAB might put. The council agreed this week that a letter sent in reply to Mr John Berrill, the NAB secretary, would confirm the CNAA's wish to cooperate.

The letter will include the proviso that a formal communications channel would be set up between the two bodies so that the CNAA is kept informed of the kind of questions likely to be asked.

It is not yet clear what the NAB might want to know but the CNAA agreed the minutes of its December

meeting that it would not participate in any formal ranking of institutions; that any comments made about an institution would be "open" for inspection to that institution; and that there would be some questions which it would not want to answer.

The letter will also say that any difficult questions will be answered by the council itself and a special meeting will be convened in August to agree the CNAA's answer. Dr Edwin Kerr, the CNAA's chief officer, said: "This matter was considered so important that it should not be delegated to any council group or any single officer."

A strategic issue paper will also be sent to the NAB identifying areas that the council would like to be consulted over. These include the need for detailed discussion over the way that multi-disciplinary courses are to be dealt with in the definition of programmes; part-time courses; the special role of art and design

since most is in the public sector; and the interplay of resources and standards with regard to support staff and equipment.

One genuine difficulty, which emerged by the end of the two-hour discussion was that the NAB itself did not know what questions it was likely to ask. So safeguards were built into the reply to ensure that the council did not commit itself blindly.

Dr Kerr said: "Members felt that there should be a proper procedure between now and the summer so that there is a staged approach and any problematic questions which the NAB might ask are not approached from cold later."

After the letter and strategic issues paper are sent, the CNAA will issue the information to the institutions. "We want the machinery to be quite clearly understood, so that there is no misunderstanding. It will all be set out in a letter to the institutions," Dr Kerr added.

by David Jobbins

Senior members of the Conservative Party have acted swiftly to stem revived allegations of possible election rigging and financial irregularities within the party's student organization.

Demands for an urgent inquiry into the standing of 74 college associations within the Federation of Conservative Students have been sent to senior Conservatives by six leading members of the FCS.

In a letter to Mr Michael Spicer, vice-chairman of the party and MP for South Worcestershire, they say: "It is outrageous that the corrupt practices of previous years may be on the verge of repetition, at yet further cost to FCS's reputation and the scale alleged in the letter had been found so far, he said. "But there are one or two we want to look at more closely."

He understood that no party funds had been spent on the booking of a room by Mr Monteith.

Mr Monteith said that the cost of the room had been borne entirely by those attending the meeting. "Not a penny of party funds was spent," he said.

Mr Monteith rejected suggestions that the colleges identified in the letter were associated closely with him and his supporters.

The receipt of funds from outside sources was one of the issues examined in an internal party investigation into FCS affairs last year. The letter is signed among others

by right-winger Mr Dellev Anderson, and two candidates who will fight Mr Monteith for the chair of the FCS at the organization's conference in Durham next week - Mr Paul Goodman and Mr John Hayes.

It concludes: "It is a poor state of affairs when a majority of national committee members, who can in no way be described as a homogeneous grouping or faction, have to write a letter such as this. But we honestly feel we have no alternative."

Mr Spicer said this week he had assured the six that steps were already in hand to check the standing of associations seeking to send delegates to the Durham conference.

No evidence of rule breaking on the scale alleged in the letter had been found so far, he said. "But there are one or two we want to look at more closely."

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AUT serves writ on medical dean

Lawyers acting for the Association of University Teachers are preparing to serve a writ on the head of a London medical school who is in the Far East. The AUT is attempting to prevent the sacking of four lecturers in medical physics who are due to lose their jobs in September.

A courier will fly out in the next few days to deliver the writ to Dr James Houston, dean of the United medical schools of Guy's and St Thomas's Hospitals and of Guy's Hospital Medical School, who is believed to be in Singapore until next month.

While seeking a High Court declaration that the United Medical Schools are acting contrary to their constitution are also being served on the dean of St Thomas's, the secretaries of the two schools and the chairman of the UMS board of governors, Sir John Greenborough.

The decision to sack the four when Guy's medical physics department closes this year was taken by the governors of Guy's in July 1981. It was reaffirmed by the UMS governors last week.

The AUT is arguing initially that the schools have failed to follow the rules set out in their scheme of management. This says that the governors have powers to appoint or remove members of staff "after consultation" in the case of teaching staff, and "in consultation" in the case of non-teaching staff.

The current legal action will not prejudice possible further writs claiming that the staff have tenure, the union says. This argument is complex because the lecturers' contracts state that their appointments are until their statutory retirement but also allow for three months' notice.

'Six of the best' for DoI cash

The Department of Industry should channel funds for contract research into six designated universities, to help create more centres of high technology like Cranfield Institute of Technology. This is the most radical proposal for promoting links between industry and higher education in the report on engineering research and development from the House of Lords Select Committee on Science and Technology.

The money channelled through industry "so that industrial commitment and market considerations are guaranteed" would be part of a large increase in spending.

The peers recommend a national strategy for industry and technology, with Government designating sectors and technologies where industry would be encouraged to innovate.

'Speak no evil'

Young people dismissed from or leaving the Youth Training Scheme early will still be entitled to a certificate, according to draft documents being considered today by a Manpower Services Commission special advisory group.

The certificate, whose purpose is primarily to help young people's progress in employment, further training or education, would consist of four parts giving details of the scheme and the young person; achievement in occupational areas; a summary of achievement in the core areas; and a summary of experience in learning opportunities.

Focus on industry

"Industry and higher education: future collaboration" is the theme of a conference to be held on July 7 which is being organized jointly by the Institute of Manpower Studies and *The Times Higher Education Supplement*.

Among the speakers will be Mr Kenneth Durham, the chairman of Unilever; Lord Flowers, rector of Imperial College; and Professor Laing Barden, director of Newcastle upon Tyne Polytechnic. The conference will be held at the London Business School and the fee will be £65. Further details can be obtained from and bookings should be sent to: Kaye Smith, Education and Training, Institute of Manpower Studies, Mantell Building, University of Sussex, Falmer, Brighton BN1 9RF. Telephone: (0273) 586731.

Fellows take a step towards women

by Paul Flather

Peterhouse, the oldest, one of the smallest, and perhaps the most traditional of the 25 Cambridge colleges, has taken the first step towards admitting women; possibly from October 1984.

Fellows, including Lord Dacre of Glinton, the Master, produced the required two-thirds majority in a vote this week to alter the statutes in favour of admitting women. A second vote is required for ratification, but this is understood to be very probable.

A blocking coalition of fellows present inside the Peterhouse senior common room of dons since mixed colleges became a serious political issue in the late 1960s, finally gave way because of a lack of sufficiently high calibre male candidates.

Cambridge now has few single-sex colleges: New Hall and Newnham admit only women, and Magdalene only men with Pembroke and Corpus.

Oxford has for the first time just published official figures of applications for 1982 broken down by individual colleges which confirm that single-sex colleges tend to receive among the lowest applications.

St Hilda's, Somerville, and St Hugh's, which admit only female undergraduates, received 217, 198, and 299, respectively, while Oriel, which admits men only, received 231 applications.

While overall Oxford admitted more state school entrants (49.5 per cent) than private school entrants (46.5 per cent) last autumn, 10 of the 28 colleges took more than half their undergraduates from private schools. Christ Church, Merton, Exeter, New College, and Worcester all had more than 60 per cent of their intake from private schools.

In contrast 15 colleges took more than half their undergraduates from state schools, led by Jesus (64 per cent), Hertford (63 per cent), St John's and University (61 per cent each).

Oxford first

Oxford students have won the right to attend the university's governing Hebdomadal Council. Dons voted 364 to 236 in favour of giving two representatives from the student union speaking but not voting rights, but in a second ballot the congregation rejected similar rights on the general board of faculties.

Prison teacher suspended over split job

An assistant education officer from Kingston, Prison, Hampshire, has been suspended for "gross misconduct" because she refused to work half her time at a local further education college.

Ms Anita Bromley, 37, faces a disciplinary hearing at Hampshire County Council on March 23 because she has rejected an order by the council that she split her full-time job at the prison, where she has worked for eight years, into six months there and four months at Highbury College of Education.

Ms Bromley was suspended on full pay from the prison, where she has taught English and foreign languages



Economics graduate Philip Berent took to the air this week in an attempt to make history, in a 14-week microflight from Salisbury, Wiltshire, to the former Salisbury, Zimbabwe, now Harare. Philip, 24, who miles each, and will be followed by a three man crowd in a jeep - two other Sussex graduates and map strapped securely to his knee.

Give youth flexible skills, says Holland

by Patricia Santinelli

Revolutionary changes in attitudes to the training and career structures of young people must be made, Mr Geoffrey Holland, director of the Manpower Services Commission said this week.

Speaking at the annual conference of the Northern Ireland advisory committee for school industry liaison in Belfast, Mr Holland said that traditional training programmes oriented towards specific jobs or employers no longer met the needs of the modern world.

"What we need to create is a new foundation learning system, a bridge between school and work which is grounded in the realities of the world of employment and unemployment, and yet enables the individual young person to develop transferable understanding, skill and motivation," he said.

Mr Holland wanted all young people to have the opportunity of learning and be treated as learners up to the age of 18. This would include a number of basic abilities within a framework which allowed them to acquire transferable skills.

Of equal importance was the need

to change attitudes towards the idea of a career structure. The belief that most people and young people in particular had a clearly mapped out career in mind was largely false. Most had haphazard job histories depending on such factors like changing interests, aspirations, monetary or other needs.

"We shall get nowhere unless we recognize that each one of us acquires 'bricks' or 'modules' of knowledge and skill throughout our lives," Mr Holland said.

Mr David Young, chairman of the MSC, introduced its corporate plan for 1983/87 and said that unemployment was expected to remain at high levels. The commission would be spending around £2,000m in 1983/84 and some £2,400m in 1985/86 in major programmes to help the unemployed.

The document confirms that the MSC is still going ahead with its scheme of occupational training to help it on supplementary standards by 1985.

The corporate plan also reveals a modest increase in the number of completions expected under the Training Opportunities Scheme.

Koestler bequest

Arthur Koestler, the writer and politician, has left instructions for his estate to fund research in parasitology at the British university.

According to his will, Mr Koestler's estate has bequeathed the subject and has discussed the bequest with the university, which has agreed to accept the bequest.

The bequest is for the purpose of research in parasitology at the British university.

Help for the harassed

Students at Glasgow University have established a committee to advise students who are being sexually harassed by staff, following a complaint from a male student.

Ms Robin Donnelly, senior vice president of the Students' Representative Council and convener of the committee, said there had been allegations that both male and female students had been harassed by male lecturers. No female staff were said to be involved.

Ms Donnelly said four SRC members were available to give advice and help to students. No student had yet asked for a case to be brought before the university. In the two weeks after the committee was set up, she had been approached by 10 women students claiming harassment, "from feeling to explicit suggestions".

Harassment seemed widespread in all departments, said Ms Donnelly, but was particularly common in arts and social sciences where the majority of students were female and the majority of staff male.

Glasgow students have also written to the local police, expressing disgust at his involvement in a video magazine which includes films of prostitutes and clients in parked cars. Mr Donnelly introduces various items in *Private Spy* including "special" designs and sex allegations by Lord Royle's maid.

Mr Donnelly has not yet replied to the students' letters, but he was reported in *The Sunday Telegraph* as saying: "I was shocked by the Guardian's 'blackmail' but I would not be regarded as the guardian of moral values."

Poly voice on UGC

The deputy director of Leicester Polytechnic, Dr Sydney Cotton, has been appointed to the University Grants Committee in a move designed to cut across the binary divide.

Dr Cotton is a member of the UGC and has been appointed to the UGC in a move designed to cut across the binary divide.



The sight Edinburgh will never see - a bus advertisement from the Association of University Teachers saying "Britain needs its universities" has been rejected by Lothian Regional Council on the grounds that it is political. Mr Ian Cramond, Vice-Convener of the Tory-controlled region and convener of the transportation committee, said neither political nor religious advertising was accepted, and the AUT slogan had "borderline implications". He added: "I personally feel if we allowed this, the next thing might well be the Educational Institute of Scotland saying 'stop the education cuts'."

Talks fail to produce offer

Opening talks on the 1983 salary award to college lecturers broke up this week with no offer from the local authority employers.

Although schoolteachers have been offered 3.5 per cent, the employers balked at an opening offer to lecturers when union negotiators refused to sign significant structural elements of the claim.

In addition to 12 per cent and a £280 flat rate award - which the employers also oppose - the unions are seeking automatic progression from the top of the basic lecturer grade and a step towards parity between public sector higher education lecturers and the universities. Employers costed the package at more than 20 per cent.

The two sides are due to meet again on March 28 - three days after the lecturers' next round of negotiations.

All groups of university workers have now lodged claims well in excess of the 3.5 per cent the university employers will tell them they can afford. Academics are seeking 12 per cent to restore salaries to their 1981 value and additional compensation for lecturers at the bottom of the scale.

A first meeting of the two sides is planned for March 28 - but after a settlement of the 1983 award, which is due from April 1, the Association of University Teachers wants talks on a new system of pay determination.

Poly voice on UGC

The deputy director of Leicester Polytechnic, Dr Sydney Cotton, has been appointed to the University Grants Committee in a move designed to cut across the binary divide.

DES grants protest

The announcement that £34m of education money is to be earmarked for specific activities brought immediate protests from the local authorities.

Under the proposed education support grant scheme, authorities would bid for grants which would be made available for specific areas of educational activity defined by parliamentary regulations.

In principle any activity might be considered suitable for such a grant in adult and further education but it is likely that in the immediate term that training and vocational initiatives for the 16-19 age group will dominate.

By way of a carrot to the authorities, the bids approved will receive a grant to meet 70 per cent of the cost, which compares favourably with the 50 per cent grant which they get from the rate support grant. But this had not appeared authorities suspicious that it will open the door to greater financial interference from the Government.

Both the Association of Metropolitan

Authorities and the Association of County Councils see this as setting a dangerous general precedent. They accept the need for grants for special needs on occasion, but with the urban areas, they see bidding for what is essentially their own money as a major change in the relationship between central and local government.

Any specific grant, for example further education for people with disabilities, will be subtracted from the block grant.

Mr John Lovell, chairman of the Conservative-controlled ACC policy committee, said he was disappointed that there had been no discussion before the consultation paper was released. "At this stage it is clear that if it is enacted, the Government will be taking more money from the local authorities."

Mr Nicky Harrison, chairman of the Labour AMA education committee, said: "Any money taken out of the existing pool of expenditure earmarked for specific projects will represent a loss of freedom of choice."

Both the Association of Metropolitan

Nuclear safety study abandoned early

by Jon Tunney
Science Correspondent

European research ministers have confirmed the premature end of the Super-SARA nuclear safety study.

The decision to end the £100m European Commission-funded project came at a meeting in Brussels attended by Mr John MacGregor, under-secretary at the Department of Industry. It follows last month's critical report on SARA by three senior research advisors.

Super-SARA, one of the EEC Joint Research Centre's largest projects, was designed to study the effects of cooling system failures in

pressurised water nuclear reactors like the proposed Sizewell B station in Suffolk. British officials have been leading critics of the work, which they believe is poorly designed and administered.

Opponents of the project argued that repeated delays meant the same information could be more easily obtained from research in other countries. Criticism increased when the EEC commissioner for research, Viscount Etienne Davignon, sought approval last year for extra spending on the project to meet rising costs.

The EEC research ministers' meeting last December sought to satisfy

the critics by commissioning a report on the project from three European nuclear research directors. But their report, completed last month, echoed the British attacks on inefficiency and poor budgeting by SARA's administrators, paving the way for last week's final termination of the project.

The politics of the decision are complicated by the present British public inquiry into the new Sizewell reactor. The European Commission was also promised that all the scientists at the ISPRA research centre in Italy, where Super-SARA is based, will keep their jobs.

Split salary plan for academics

by Ngao Crequer

University academics' pay should be divided into two elements, teaching and research, to increase institutional flexibility and encourage efficiency, according to the argument of a paper in the March issue of *Public Money*, an independent policy journal sponsored by the Chartered Institute of Public Finance and Accountancy.

The authors, John Grettton, the journal's editor, and John Posnett, economics lecturer at York University, argue that separating the two elements would give greater cost control to university departments and enable academics to have more choice in the part work they undertake.

Under their scheme the University Grants Committee would continue to distribute money to universities for teaching purposes according to student numbers, and for research purposes, according to a notional sum of low rank university money is attributable to research.

The UGC would have to decide how to allocate its research money to individual universities. It would do this by assessing university bids for the money. In the universities, research committees would assess the needs of competing departments. This would encourage departments to bear the costs, as well as benefit

from economics, in the use of resources.

A UGC research committee would see that every university received an appropriate, if not equal, share of resources, and would protect minority subjects, and prevent duplication. If a university failed to prevent viable bids, it would get no research money. But if this were too drastic and meant that a university doing no research would perhaps cease to be a university, the UGC could guarantee every place a minimum rate.

The authors also propose a piece-rate payment for teaching. There could be a flat-rate payable independent of teaching load and a unit teaching fee, based on individual courses.

Academics could trade off teaching time against research time and departments could offer merit payments to improve both teaching and research.

Departments would have much greater responsibility for evaluating academic work and assessment would become more important.

Academic Salaries: how to distinguish payment for teaching and research in universities, by John Grettton, with John Posnett, in *Public Money*, volume 2, number 4, March, 1983.

Technology must be servant of society, says Lindop

Technology was in danger of becoming the master instead of the servant of society. It was unwise to trust the "sorcerer's apprentice", Sir Norman Lindop, the former director of Hatfield Polytechnic, said last week when he gave the Hatfield inaugural lecture.

Scientists were motivated by curiosity, by a desire to know more about the phenomena of nature. Technologists were concerned with translating the work of scientists into practical uses. And because each scientist and each technologist was only part of the chain he or she could not be expected to have the moral responsibility for the result, he said.

"We have long passed the point where individual scientists can be held uniquely and solely responsible for the social consequences of their work, though this cannot exempt them from all concern for what happens, nor exonerate them if, glimpsing alarming possibilities, they take no action with those who are in a position to do something about it."

"Yet scientists and technologists can wield great power in our society, often unaccountably and in secret. There should be a counter-force," he said. Sir Norman used the occasion, made possible through his request that part of the money collected by staff on his departure should sponsor an occasional lecture, to call for greater democratic control of the expert.

The nuclear arms race was "a classic story of pure, exciting but apparently ivory-tower science... unlocking a source of energy of unimaginable magnitude". Lord Solly Zuckerman, for six years chief scientific adviser at the Ministry of Defence, had alerted us to the fact that

technologists were "no apostles of peace" but, as the men in the laboratories, had become the "alchemists of our times", intent upon perfecting the art of nuclear weapons, Sir Norman said.

"It is he, the technician, not the commander in the field who starts the process of formulating the so-called military need," he said. "The men in the nuclear weapons laboratories of both sides have succeeded in creating a world with an irrational foundation, on which a new set of political realities has in turn had to be built."

In the same way, he argued that information technology would end up leading society if it was not in its turn democratically controlled. Television, radio and now the computer which was a "more vital component than either of the others" had penetrated deep into society's structure. Information gathering systems meant that the surveillance of whole populations was now possible and may already be going on. As past chairman of the data protection committee which reported to the Home Secretary, Sir Norman had doubts about the Bill now passing through Parliament.

"The important principles of data subject access and the independence of the data protection registrar are observed but so many loopholes and exemptions are proposed for the police, intelligence services, taxmen and immigration officers that it sets at naught many of the safeguards," he said.

But democratic control of technology required a basic level of scientific literacy in the voter. Sir Norman argued for basic science for all up to 16 years.

Reprieve for school of art

Winchester School of Art has been saved from closure. A Hampshire working party set up to discuss the problems facing advanced art design has recommended no change in the existing arrangements. It says a consortium should be set up to coordinate future policy.

The recommendation follows meetings between Winchester School of Art, Southampton College of Higher Education, Portsmouth Polytechnic and Portsmouth College of Art, the chairman and leader of the council and other elected representatives.

It is expected that the council will accept the recommendations in full.

The problems in bridging the gap

by Jon Turney
Science Correspondent

Play the researcher trying to keep control of a project which spans more than one discipline. A recent study of the problems faced by postgraduate students in this position identified no less than 23 pitfalls of interdisciplinary work - from communication difficulties between members of a multidisciplinary team to deciding who to ask for money.

Tom Whiston of the Science Policy Research Unit at Sussex University studied problems faced in interdisciplinary higher degrees for the joint committee of the Social Science Research Council and the Science and Engineering Research Council. This was the major source of funds for work which draws on both social and physical or biological sciences.

An abridged version of the full project report will not be available until the summer, but Whiston's checklist of problems gives an idea of the responses to his questionnaire, sent to recipients of joint committee grants.

Many of the difficulties stem from the choice of "real world" research problems - a choice which the award of grants for multidisciplinary projects is designed to encourage. But this means dealing with messy systems, which may well change during the study, and which involve people who may be hostile to academic investigations.

At the same time, would-be researchers will find other academics dubious about multidisciplinary work. They may have difficulty explaining exactly what the project entails and presenting results in a format acceptable to peer scrutiny and outside readers.

Students will have to avoid the temptation to go off at a tangent, and make sure the project does not end up with something quite different from the goals originally specified.

To this will be added problems of learning on the job - as few intending researchers are equally well-versed in several areas, making constructive use of theory from a foreign discipline, keeping options for research open and keeping an open mind about the problem.

Dealing with this list, it might seem best to want to stay outside the security of a single discipline, but Whiston's final problem - deciding whether you are "problem solving" or "playing at being God" also shows part of the appeal of multidisciplinary research. Few researchers on more conventional projects have the opportunity to do either.



"Brown Sugar" by student Niall Woolf, of the department of graphic design at Wimbledon School of Art. Third year students have for the first time staged an exhibition of their work at a public gallery. "On your Marks" at the Association of Illustrators Gallery, Colville Place, off Charlotte Street, London can be seen until March 25.

Ulster draft 'too permissive'

The Association of Polytechnic Teachers has criticized the draft charter for Ulster's new university as providing insufficient commitment to continuing education and protection against academic drift.

The important statement of purpose for the new institution - a child of a marriage between the New University of Ulster and Ulster Polytechnic - follows the pattern of all recently-written charters in saying "The university shall be a teaching, research and examining body."

Following that statement of purpose, the institution's powers to fulfil it include providing study and qualifications at various levels and in

various modes - in other words continuing education.

But the APT, in a letter to Sir Peter Swinnerton-Dyer, chairman of the steering group overseeing the merger, says the distinction between powers and purpose gives the university too much leeway.

"Without such a statement of purpose (including continuing education) there will be the opportunity for the new institution to drift into conventional patterns of educational provision, typically two A level entry, three-year full-time academic honours degrees. The powers suggested are permissive, and not a statement of objectives."

Making the most of a bad job

by Karen Gold

Advice without gobbledegook on all aspects of unemployment from legal rights to cheap recipes is the subject of a "redundancy pack" developed from a Lancashire adult education department.

The pack has been produced in pilot form by the liberal arts department of Nelson and Colne College, which is negotiating with the Department of Employment to distribute it throughout the country.

It would be most appropriate in job centres, according to the head of the department, Mr David Biezard. It comprises seven self-contained sections on redundancy, working notice, claiming unemployment and social security benefits, dealing with money, finding work, and a catalogue of general information including useful addresses.

All are produced in simple language with an attractive layout, with cartoons and illustrations. Much of them are a simple rewriting of information in local and national government leaflets, with gobbledegook removed.

"They include explanations of redundancy and what to do when made redundant, legal and welfare rights, job applications, and practical advice - cheap recipes and heat-saving tips - for those living on welfare benefits."

To obtain all the information, an individual would have to visit about 100 offices in any borough, according to Mr Biezard. Three workers on a Manpower Services Commission scheme designed by the college collected it in a year. They also did a survey of 1,000 unemployed people throughout the country on what they would like contained in the pack.

The project began when staff at Nelson and Colne found themselves spending increasing time advising adult education students on these subjects, or sending them to the local job centre.

"It became apparent that the job centres were swamped, so they could only give people gobbledegook," said Mr Biezard. The college began an adult education course in the subject, but decided it was an inefficient way of distributing the information as widely as possible.

OU postpones three courses

Three Open University courses currently in preparation are to be postponed for a year so that the university can meet Government cuts.

The decision by the university's senate committee follows predictions of retrenchment made after the Department of Education and Science announced last year that the OU's grants for 1983 and 1984 would rise by less than 3 per cent.

Two of the postponed courses are course A317, themes in British and American history; and course D307, social psychology.

The third course - U235: conflict and security in a nuclear age - is postponed from 1985 to 1986.



Leicester Polytechnic knitwear technology technicians Isobel Hill and Dennis Cragg pose in an outside cardigan made up for an Italian who could find nothing to fit him in his own country. Polytechnic students will take the garment, which took 56 balls of wool, to Milan when they visit a trade fair there.

Report shows engineers still unhappy with their lot

by Jon Turney
Science Correspondent

The sorry state of British engineering education was highlighted again this week by a report from the Goals of Engineering Education Project at Leicester Polytechnic.

Sir Monty Finniston, whose report in 1980 called for radical changes in engineering education and training, welcomed the new study, which shows that both graduate engineers and their employers are very dissatisfied with the existing curriculum.

At a press conference at the Institute of Electrical Engineers, Sir Monty said that the Leicester study underlined the need for urgent action.

Geoff Beuret, who directed the study, agreed that the research results from interviewing young graduate engineers filled out the picture painted in the Finniston report, but stressed that the Leicester team had "no desire to bash engineers - our critique is based on the views of engineers themselves".

Most speakers looked to the new Engineering Council, created to carry out the recommendations of the Finniston report, to promote

answers to the problems identified in the new study.

Sir Monty said: "I would deposit a lot of copies of this document with the Engineering Council - they've got to justify themselves in the end, this is one way they can do it."

Mr Geoffrey Harrison, chairman of the Institute of Mechanical Engineers, said that one way the Engineering Council could grasp the nettle immediately would be by producing a coherent syllabus for an "Engineering in Society" paper, as proposed by the institute last year.

Sir Monty also stressed that increasing provision for continuing education was crucial to achieving the improvements in practising engineers' knowledge which they and their employers wanted. Extended degree courses were not a panacea because it was useless trying to cram everything needed into a course at the beginning of an engineer's career.

"We've got 75 establishments for higher education, and the argument that we can't afford to send people to them for continuing education is absurd," he said.

Survey details: page 8

Funds fall worries sociologists

Sociologists are increasingly alarmed about "vicious cuts" in research and the fall in sociology postgraduate awards to more than half the total of five years ago.

The British Sociological Association, which has 1,400 members, has written to the Social Science Research Council expressing its concern over current cuts, drawing particular attention to the proposed discontinuation of British Election studies.

The allocation of SSRC postgraduate awards in sociology have fallen from 178 in 1978/79 to 77 in 1982/83. The fall is broadly in proportion to the overall fall in SSRC awards from 1,672 to 754 in five years forced by repeated government cuts.

The proportion of funds going to sociology has however risen from 11 per cent in 1980/81 to 12 per cent in 1981/82, but the total budget available was smaller.

At a briefing in London last week the BSA made clear it did not feel sociology was being singled out for special cuts but it was alarmed about the level of cuts in the social sciences

in general. It believes that in the past two years no full time sociology graduate has managed to secure a tenured university teaching post. All vacant posts have been filled by existing sociology teachers.

On the other hand interest in sociology seemed to be increasing, with pressure on university admissions picking up. In part to deal with this the BSA has just distributed 13,500 copies of a new booklet "explaining opportunities and what the subject involves."

Statistics from the Universities Central Council on Admissions show almost twice as many women sociologists as men, with about one in five men and one in nine women believed unemployed six months after graduating in 1980/81.

"Sociology - information, and opportunities and details of the conference Beyond The Fringe - The Periphery of Industrial Society, free from the BSA, 10 Portugal Street, London WC2A 2HU.

Olga Wojtas reports from the Scottish NUS conference

Students' vote is 'vital'

Students' votes will determine the outcome of elections in 10 constituencies and will heavily influence another 32, according to the chairperson of the National Union of Students in Scotland.

Mr Bob McLean, addressing the union's annual conference in Helensburgh, said: "We intend to use our democratic power to affect the outcome of the next general election in the Scottish Student Marginals."

Mr McLean challenged Mr George Younger, Secretary of State for Scotland, "who has presided over a massive denial of educational opportunities in Scotland", to a public debate in Craigie College of Education in his constituency on student loans and education cuts.

Mr Graham Scott, of Strathclyde University, said loans were the most important issue students were con-

fronting, and an election year gave them a unique opportunity to express their views on the future of the education system.

"Not only do loans discriminate against working class students, women students and mature students, but even the Government's own estimates show that such a scheme would be uneconomical. What you have is a thinly disguised attempt to make education the privilege of a wealthy few," he said.

The conference unanimously passed a motion saying that the present mandatory grant scheme had played a crucial role in the expansion of higher education, and it reaffirmed its support for a grants system free of any parental contribution.

The students welcomed the Law Lords' recent judgment that overseas students might be seen as ordinarily

resident in this country.

Ms Gloria Murray, of the union's Scottish executive committee, said: "This has important implications for grants, fees and national health service charges for overseas students, and NUS should take the lead in putting the pressure on the Scottish Education Department to charge home student fees and consider overseas students for mandatory awards."

The union is to seek a meeting with the SED to urge that high fees paid in the past by overseas students eligible for lower fees will be refunded.

It will also encourage institutions to take out block medical insurance for overseas students until the decision to charge certain students for the National Health Service has been repealed.

Funds raised for peace camp

The conference raised £103 through a raffle and disco for the nearby peace camp outside the Faslane submarine base, which is a potential Trident missile site.

Mr Ian Birrell, of Aberdeen University, unsuccessfully proposed that the visit to the Faslane peace camp should be cancelled. "This is a classic example of NUS wasting its time, for while this might be a very important cause, this is a very short conference, and we have been elected to come here to decide policy," he said.

But Mr Keith Leadbetter, of the Scottish executive, said the union's policy on peace and disarmament committed it to active campaigning.

The conference also passed an emergency motion to send a telegram of support to the women's peace camp at Greenham Common, and condemned the court order evicting women from the site as "a political move by the courts to silence opposition to the Government."

One nursing centre urged

by Sandra Hempel

Nursing studies within London University should be concentrated in a single expanded department at Chelsea College at the expense of other existing and proposed courses, a university working party has recommended.

The working party, set up on the advice of a special advisory committee last summer, says that the course at Bedford College should close and find proposals for a new course from University College and the Middlesex Hospital Medical School to be no answer to immediate needs.

The key element in the university's undergraduate programme should be a four-year integrated BSc course and the "immediate object" should be a department which can sustain postgraduate teaching and research as well as the undergraduate course.

Recommending no further intakes to the Bedford course, the report says that besides difficulties that would arise over the merger of Bedford with Royal Holloway and the subsequent move to Egham, there were other problems with the course, which is run in association with Middlesex. "Difficulties clearly exist between Bedford and the Middlesex Hospital School of Nursing", the report says.

Turning to a proposed BSc in nursing studies at University College/Middlesex, the working party was concerned that the plans, while "admittedly in a preliminary form, do not appear to give adequate emphasis to the development of a strong department of nursing studies."

The working party was, however, "impressed" by the Chelsea course and "had no doubt" that it should continue and that the university should ensure there was no reduction in the number of undergraduate nursing students. Chelsea should be given resources to increase its intake as soon as possible from 24 to 30 or 32 and in the long-term to around 50.

'Waive fees for jobless'

All local authorities, central institutions and universities should waive their fees for part-time students who are unemployed, delegates decided.

There was strong criticism of the "21-hour" rule whereby jobless people may not qualify for unemployment benefit if they take up part-time study.

The conference passed a motion condemning this as "a deliberate attempt by the Government to artificially reduce the demand for further education in an attempt to justify their savage cuts in education spending."

The conference also called for an increase in the £25 allowance for young people on the Youth Training Scheme which will be implemented in September. It opposed the proposal that young people refusing to accept a YTS place should have their supplementary benefits reduced for six weeks.

Mr Bob McLean, the NUS Scot-

tish chairperson, said: "We believe in choice, not compulsion, for young people. He added that if the scheme was to lead to further study and training, further education must have more resources."

Around 47,000 young Scottish people would be involved in the YTS, and there was growing concern over their accommodation. Many colleges were already full, and could be forced to put the trainees or other further education students in unsuitable, inadequately equipped premises.

Colleges of education had a vital part to play in staff development and in-service training both for the YTS and new Scottish Office proposals for 16 to 18-year-olds, but they had been cut so badly in the past five years, with three college closures, that they could not cope without a considerable increase in resources, said Mr McLean.

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TT3

China scholar expelled 'because of political pressure'

from E. Patrick McQuaid

CAMBRIDGE, Mass. A classic row over academic freedom has been triggered off among American anthropologists by Stanford University's decision to expel a scholar-turned-journalist who published a series of vitriolic articles on Chinese rural health care that have infuriated Peking.

Last month Mr Steven Mosher, a doctoral candidate, was expelled from Stanford's graduate anthropology programme following an internal report on his activities by a panel of teaching staff. Professor Clifford Barnett, who heads the department, would say only that Mr Mosher had violated scholarly guidelines, "misbehaving professionally".

But many scholars claim that Stanford has bowed to pressures from the Chinese Academy of Social Sciences and the Peking Government which complained that Mr Mosher had exceeded the scope of his research and that his publications were politically motivated. An anthropologist with the University of California at Berkeley went so far as to say that research by Western scholars as a result of Mr Mosher's actions, though

there has been no official word from the Chinese to support this. Mr Mosher was one of the first American scholars permitted to carry out extensive field research in rural China. In separate excursions in 1979 and 1980 throughout the southeastern Guangdong province, he said he observed forced abortions - some at the last stages of pregnancy and government-sanctioned infanticide. Peking has not challenged his findings so much as his decision to publish them in the popular press. Mr Mosher's accounts were carried by the *Asian Wall Street Journal*, published in Hongkong, and a magazine supplement to the *Sunday China Times*, a Taiwanese periodical the mainland considers politically abusive.

Peking officials claimed that by publishing in Taiwan Mr Mosher made it clear that the purpose of his work was to attack China. Chinese academics said he had violated both professional ethics and local regulations, endangering the prospects of future field research for Western scholars.

The executive director of the American Anthropological Association, Mr Edward Lehman, has said

that the Chinese have not given any indication of closing the door to American or other Western anthropologists and social scientists. Scholars on both sides of the issue found especially objectionable the Taiwanese publication of photographs in which the faces of abortion patients in one Guangdong clinic were recognizable. In his reports Mr Mosher said he accompanied a group of Chinese women through the government-sponsored birth control programme. During emotional group meetings, he said, the women were taken to a clinic and injected with drugs to kill the foetus or induce abortion. Those refusing abortion were kept at the clinic until delivery. The infants were then killed, claims Mr Mosher.

The anthropologist, 34, says what he witnessed was barbaric and what he published was objective and scholarly. He has said he will probably appeal against the Stanford decision and then taken legal action. "I was expelled because the faculty committee of 11 unanimously chose to believe charges brought by the

Chinese that my articles about rural birth control had endangered the lives of innocent villagers," he said. Mr Mosher also cited testimony from his ex-wife, Maggie Su, as part of the evidence against him. "When she visited me in the village of Guangdong province in April of 1980 and I asked for a divorce, she said she would ruin me."

Mr Mosher was flown to San Francisco at Stanford's expense to be allowed a chance to respond to a committee report questioning his professional conduct.

"I was a graduate student. If I were a faculty member, matters would have turned out differently," Mr Mosher wants to have the report that convicted him released to the public, but cannot because that could endanger the possibility of his taking legal action.

Dr Clifford Barnett, chairman of the Stanford department of anthropology, said that the report could not be released because it contained information that might be injurious to innocent parties. He also said in a letter to Mr Mosher that the decision to expel him from the programme had been made with great regret. He praised his excellent academic record.



Steven Mosher with the report that brought about his expulsion from Stanford.

House ignores Reagan's call for cuts

In a stinging rebuke to President Reagan's attempts to curb education spending the House of Representatives has approved expenditures totalling \$425m to upgrade programmes in science and mathematics training during the next fiscal year - \$350m more than the White House had recommended.

Similarly legislation has been introduced in the Senate which last week began hearings before the labour and human resources committee to explore a host of comprehensive measures.

Meanwhile the House education and labour committee has forwarded its recommendation that \$7.4 billion be allocated for higher education programmes. That exceeds the president's request by \$1.3 billion.

The House bill was passed by 348 to 54 votes, but not without some vocal opposition, mainly from Mr Reagan's fellow party members. Republican John Erlenborn of Illinois, a ranking minority member of the education and labour committee, said it was "the height of irresponsibility to create a new \$400m spending programme in light of the \$200 billion federal deficit".

He said Americans were hoping that "throwing money at a problem" would make it disappear.

But Democrat Charles Perkins of Kentucky, who chairs the committee, and is co-author of the legislation, reported that 43 states claimed shortages of maths teachers and 52 reported shortages of physics teachers. In addition, half the newly employed maths and science teachers in the nation were not qualified to teach those subjects.

According to the House bill, the Education Department would receive \$295m next fiscal year to improve science, mathematics and foreign language instruction at pre-college levels with the remaining \$130m allocated to the National Science Foundation to initiate and support programmes at the tertiary level.

Of the foundation's share, \$100m would be placed in a special fund which would be used to help colleges and universities buy new equipment. Congress members hoped the funds would be matched by local industries with an interest in maintaining university-level research.

Most of the Education Department's funds would be earmarked for local school districts and state education agencies for maths and science programmes. About \$20m would go for college scholarships and another \$20m for retraining secondary school science and maths teachers during summer seminars.

The 150,000-dollar question

The news that the new president of the multi-campus University of California system will receive a salary of \$150,000 a year, the highest on record, has again generated interest in academe.

Last year a stir was caused by the announcement by Texas A and M that it would hire a popular football coach for a record \$287,000 salary - a six-year contract that it would recruit a top physicist with similar enticements.

At the time, the American Association of Universities, the College and University Personnel Association reported that the California's new chief executive will earn more than any other president of a single institution.

Among the highest paid administrators are two deans of medicine, earning "at least" \$150,000 and 23 others averaging \$100,000 or more.

Two chief executive of higher education systems are reported to be earning between \$135,000 and \$140,000 and at two separate institutions the presidential salaries are between \$140,000 and \$146,000.

The median salary for the chief executive of a system is reported to be \$66,725. In the public sector, such as California's system, the median salary is \$65,950 while private systems average \$72,000 for chief executives. The average pay for university presidents is \$77,252 and for four-year college systems, \$69,000. Public institutions report an average salary of \$55,693 while private institutions pay \$55,400. All universities average \$67,760 for presidents while four-year colleges pay \$54,000.

Individual salaries are generally kept confidential. The annual survey by the Washington-based agency is designed to reflect a broad overview.

Football coaches are not included in the survey, although the median scale for a men's athletics director at all responding universities is \$34,000 and \$26,747 for a women's athletics director. Mr Jackie Sherrill, at Texas A and M, holds all records for top salary while the coach at the University of Oklahoma, Mr Barry Switzer, was reportedly paid more than \$1,000,000 last year.

The move follows parliamentary bickering over proposed amnesty plans for Canada's estimated 200,000 illegal immigrants and reports that Iranian students at Canadian universities are being harassed, beaten, and threatened with death by henchmen for the Khomenei regime.

A foreign student advisor at Montreal's Concordia University claimed at a recent news conference that a man charged with the stabbing of a student there was a frequent visitor to the Iranian embassy in Ottawa. An embassy representative, Mr Mohammed Fadai, denied allegations that the suspect was a government employee.

Last year a near riot broke out at Concordia between anti-Khomenei students and supporters of the Ayatollah, who were said to have been bussed in for the occasion. The student advisor, Ms Elizabeth Morey, said the university's 200 Iranian students had reported several instances of harassment to her office.

In addition to the stabbing incident, another student says he has received telephone calls in the middle of the night threatening him with death because he has been distributing pamphlets opposing the Khomenei government. His room mate, not an Iranian, was told to move out or face violence.

Mr Masoud Ramzy, of the Canadian Muslim Iranian Students Society, an affiliate of the Marxist-Islamic "embayehdini" movement, said embassy visitors had been assaulted while renewing their passports and told that their families would face reprisals at home for their activities in Canada. Concordia students also reported that an Iranian non-student had followed them on campus, listening in on conversations. The Mojaheddin contingent supported the Islamic group but were later driven into exile.

An Ottawa attorney, Ms Kathryn Barnard, says she has represented Iranian students who "in order to retain scholarships have had to meet 32 different criteria imposed by the Canadian government."

Numerous international human rights agencies have documented that students opposed or suspected of opposing the Iranian government have been facing squads on their return.

Immigration boost for Iranians

Special immigration measures were approved in Ottawa this month to permit 2,000 Iranians to remain in Canada. The ruling by the Canadian Immigration Department will allow them to apply for permanent residency without having to leave the country, the normal channel of registration.

The move follows parliamentary bickering over proposed amnesty plans for Canada's estimated 200,000 illegal immigrants and reports that Iranian students at Canadian universities are being harassed, beaten, and threatened with death by henchmen for the Khomenei regime.

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All-Africa research centre: site chosen

by Thomas Land

The Ivory Coast is likely to host the proposed Institute for Natural Resources in Africa intended to concentrate advanced scientific research and training throughout the continent. The institution will cost up to \$50m to set up and up to \$4.5m a year to run.

Its establishment, planned by the United Nations University with the backing of the Organization for African Unity and the Economic Commission for Africa, is to stimulate research and development in the spheres of natural resources, agriculture and the environment, meeting the specific scientific needs of some of the world's poorest countries.

The institutional structure and operational approach of the institute will have to be assembled with great care to take into account the classified nature of most information related to natural resources.

To be successful, the institute must on the one hand win the support of African governments much concerned with national security; on the other, it must pool and share specialist knowledge among the continent's various institutions.

Advanced discussions on the site of the institute have been taking place since late last year. Dr Thomas R. Odilambo, director of the International Centre of Insect Physiology and Ecology in Nairobi and chairman of the UNU's group of experts in charge of the establishment of the institute, opened talks with government ministers in Ivory Coast in September. He was accompanied by Dr A. A. Kwabong, the vice-rector of UNU responsible for institutional planning and resource development.

Professor Odilambo says the site must include free access to excellent national scientific institutions, adequate agricultural, chemical, industrial, civil, mechanical, electrical and electronics.

Prestige engineering school may be put on the shelf

from John Walshe

DUBLIN Fears are growing that the government is about to shelve the biggest ever educational project in the country - a new engineering school at University College, Dublin. It was due to go out to tender later this year with completion in 1987. The total capital cost was estimated at 120m while equipment would cost another 150m.

Officially all that has happened is that planning for the project has been halted pending "clarification" of UCD staff regard this as a euphemism for a long delay. And the temporary halt has alarmed outside agencies such as the Institution of Engineers of Ireland which says that planning massive projects like this cannot be turned on and off at a moment's notice.

A decision to site the school on the 300 acre UCD campus on the outskirts of the capital was first taken in 1974 and detailed planning has been taking place over the past few years. The school was to house 1200 undergraduate and postgraduate students and would have replaced older, inadequate buildings in the city centre.

It was intended to cater for the various branches of engineering including agriculture, chemical, industrial, civil, mechanical, electrical and electronics.

The possibility of a long delay has also alarmed the Confederation of Irish Industry which says the new facility is necessary to help Irish industrial development.

However, the education minister Mrs Gemma Hussey faces a very real dilemma. If the engineering school goes ahead in its present form it will use up most of the capital likely to be allocated to the third level sector over the next few years. There would then be very little left for the four regional colleges planned for the greater Dublin area or extensions planned for the existing institutions.

Meanwhile, the first official strike at Trinity College, Dublin, has ended among some confusion as to who will actually foot the bill for part of the settlement.

The strike by security and maintenance staff was over a 27.50 increase but the government feared that conceding it in full would breach a clampdown on special pay rises. The 1200 undergraduate and postgraduate students and would have replaced older, inadequate buildings in the city centre.

tele-systems for obtaining real-time remote-sensing data and establishing on-line access to data banks.

The projected medium-sized African institute is to have the best possible physical facilities and support services for efficient management and effective output. Its programme of work will be carried out through a network of participating scientists and institutions throughout the continent.

Research at the institute will concentrate on industrial development through exploration, assessment and innovation in such spheres as land-use, energy, water and mineral resources. It will promote interaction between the modern scientific approach and traditional empirical knowledge and skills.

The institute is to provide the necessary initial expertise and facilities enabling its participants to achieve a competitive edge and the capacity to undertake consultancy services. Its work will necessitate a range of research facilities which are at present beyond the reach of most universities in Africa.

Research associates at the institute will be appointed for five years each, with the possibility of renewal. Eventually, they will be drawn from all countries of the continent but, at the start of the scheme, the selection process will concentrate on assembling scientific and technological capabilities in the shortest possible time.

The training programme will be closely related to the research and development work of the institute. It will be planned to help African countries to increase their domestic research capabilities and to develop composite skills for the collection and processing of data related to natural resources for practical application.

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Indonesian university administrators with Mr John Wilcox of Loughborough University at a reception held for them in London recently. The administrators, part of a group of 16, were at the end of a six-month training course sponsored by the British Council and run by the Conference of University Administrators. The Indonesians gained experience in several British universities and colleges as well as receiving formal teaching.

Caste row closes university

from A. S. Abraham

BOMBAY The prestigious Jawaharlal Nehru University (JNU) in New Delhi, more lavishly endowed than any other higher education institution in India, has been closed until further notice, bringing to a head a prolonged strike by students against their teachers.

The JNU Students' Union has accused Dr P. C. Saxena, in the school of computer sciences, of making derogatory remarks and discriminating against Untouchable students. It also wants an inquiry into alleged corruption in the school. The students want Dr Saxena to be arrested for "caste victimization", an offence under the 1955 Civil Rights Act. The police have themselves filed a complaint against him and prepared a warrant for his arrest. Until he is presented in court, the student union wants him suspended.

However the JNU Teachers' Association has opposed the students' demand for suspension without first investigating the charges. To back their case, the teachers went on a day's token strike.

Acting vice chancellor, Professor P. N. Srivastava, says an investigation into Dr Saxena's conduct can be held until the police complete their examination of the charges. To defuse the tension arising out of this state, the vice chancellor felt it prudent to close JNU indefinitely.

JNU has been disrupted by such conflicts so often as to become synonymous with university malfunctioning. A minority of "committed" teachers and students, with communal links, has repeatedly held the university to ransom. That alliance has since split.

Neither the federal education ministry (JNU is federally administered) nor the University Grants Commission wants to have anything to do with putting things right in an institution which has been going downhill almost from the beginning.

"No one would lose a night's sleep," said a New Delhi daily newspaper "if the university was simply dismantled".

Dr Stanley Kalpage, chairman of the UGC, said that at the Colombo university students of all faculties, except the medical, were involved. He has also asked the Education Ministry to recall to service some 450 government teachers, assigned to follow a university course, who were also boycotting lectures.

At Jayawahanapura, an "illegal" university students federation held a meeting, creating a disturbance near the office of the "Competent Authority" (Mr K. Koditjwakku) who is reported to have suspended a student leader and dissolved the student council.

Dr Kalpage said students were required to attend 80 per cent of lectures to be eligible to sit examinations and this examinations would not be postponed.

Hawke's cash problems could delay promises

from Geoff Maslen

MELBOURNE With its largest majority ever the new Labor government under prime minister Bob Hawke faces enormous financial problems which could mean its promises to higher education may not be met for some time.

Labor undoubtedly received strong support on the campuses and many academics and students will be eagerly waiting for signs of the new era. In the short term - given that the Government could be facing a A\$9,600m deficit in 1984 - promises which cost lots of money may not be realized, although it seems certain that the supplicants from higher education circles will get a better hearing.

In some areas, however, the Hawke government is likely to take immediate action. It has promised, for instance, to increase participation rates as part of a campaign to reduce levels of unemployment - financial assistance. Labor promised before the election to increase the tertiary education allowance to the level of the single unemployment benefit, although it gave no timetable by which this would be achieved.

In the area of research, Labor will introduce 300 new post-doctoral fellowships. But this will be phased in gradually with no timetable for completion. Only in the field of technical and further education has Labor given a concrete promise: an extra A\$45m over the next three years.

However, Labor is committed to reintroducing triennial funding for capital works and equipment, a system which was suspended by the last Labor government in 1975 and abolished by the Fraser government in 1976. Triennial funding for recurrent funding only was restored in 1978. Labor also says it supports the establishment of a university in the Northern Territory, although it seems likely this will be gradually phased in also and there is no certainty the initial money will be provided in the 1985-87 triennium.

Under Labor the Fraser government's controversial loans scheme will be scrapped but it will honour any promises already made to students who sought loans before the election.

On the other major controversial issue, the amalgamation of 30 Colleges of Advanced Education, Labor has said it will review some of them, including the mergers of colleges with universities at Armadale and Newcastle in New South Wales.

General Jaruzelski's views in the Polish intelligentsia have been grossly distorted, mutilated and often simply falsified by the Western media, the Warsaw daily *Zycie Warszawy* claimed last week.

According to Zdzislaw Morawski, the newspaper's editor in chief, the general has "no new hard line against intellectuals and the creative milieu." All that he threatened, Morawski claimed, was that "administrative measures" could be applied against "evidently hostile, adventurist and destructive activities".

General Jaruzelski, he said, had always, both before and after the imposition of martial law, "consistently and with moderation, sought a dialogue with the intelligentsia and held in respect the distinct nature of creativity and a difference in world outlooks."

This interpretation does indeed conform to the general's text. His speech of February 27 (the prime source of "misinterpretation") attacks only "certain circles" of the intelligentsia.

Teachers charged after a year in jail

from Hasan Akhtar

ISLAMABAD Mr Tariq Ahsan and Mr Jamil Umar, according to the prosecution, Mr Umar was seized by a night by a watchman in a commercial area while he was allegedly attempting to place into a bookshop objectionable printed material in November 1981. The police later arrested Dr Saleem and Mr Ahsan on the charge of complicity.

General Mohamud Zia-ul-Haq, Pakistan president had promptly awarded a prize to the watchman. When the accused were brought before the military court headed by Colonel Altaf Rahman, the prosecution alleged that they were found to be in possession of copies of a journal, *Jamhoori Pakistan*, (*Democratic Pakistan*) and a few other titles. After initial objection by the defence that they should be tried separately, because their cases were registered separately, the prosecution framed a revised charge sheet accusing all three of complicity. The military court is expected to hold the hearings during this month.

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There remains a conflict, however, between the loyalty to objective work which inspired the "Flying University" and now the underground study groups of the Social Self-Defence Circles, and the general's diatribes against dissident intellectuals.

that the roots of their subject have been laid bare by some other author, with the effect that we end up with a text that is utterly barren from the standpoint of the history of ideas.

The history of science and especially of scientific textbooks has demonstrated over and over again the truth of a rubric that everyone would be editor should reproduce. In pocket work find hang somewhere where he can always see it; there is no substitute for the work of one mind. The textbooks we got most from and read with most pleasure and are most grateful to their authors for, have all been the work of one mind who sees the whole subject as we ourselves shall one day have to see it.

It takes nerve, of course, to write a book and to do roughly accuse my scientific colleagues of lack of nerve — or anyhow of behaving just as if their nerve had failed them in the matter of writing books, of finding innumerable excuses for not doing so and of condoning and conniving at the existence of those book-substitutes I have been finding fault with.

The author is president of the Royal Postgraduate Medical School. He has been a member of the scientific staff of the Medical Research Council since 1952 and is the author of Advice to a Young Scientist.

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BOOKS
MATHEMATICS
AND PHYSICSPhysical
truths

Quarks, Leptons and Gauge Fields
by Kerson Huang
World Scientific: Wiley, £24.00
ISBN 971 950 03 0

During the middle and late 1970s,
particle physicists arrived at a widely
agreed view of the microscopic structure
of matter: things are made of
quarks and leptons, which are held
together by forces, described mathematically
by "gauge field theories",
which include and generalize the
electromagnetic interactions familiar
to all of us on a macroscopic scale.
Evidence, such as the recently
announced discovery of the W-boson
at CERN in Geneva, has continued
to accumulate, indicating that
these ideas are essentially correct.
A sure sign of the emergence of
this kind of consensus is the appearance
of an increasing number of
books on the subject. Some years
ago specialized research monographs
on gauge theories began to appear,
which have been followed more recently
by pedagogically oriented
texts, suitable for graduate courses:
this is, after all, what all graduate
students in particle physics are being
taught nowadays. The present
volume is in the latter genre, though
at an advanced level: it is written for
"graduate students in physics who
have some knowledge of the experimental
part of particle physics, and an acquaintance
with quantum field theory, including
Feynman graphs and the notion of renormalization".
The author hopes that it
might "serve as a text for a one-
semester course beyond quantum
field theory".

are certainly possible, it is evident
from this short list of prerequisites
that the acquisition of detailed knowledge
of, and expertise in, gauge
field theories is a formidable task.
As with general relativity (with
which they have much in common,
and may even have more), these
theories are beautiful in conception
but mathematically intricate in practice.
Einstein related gravity to
geometry, and in a similar way gauge
theories relate forces to symmetries,
a subject which has fascinated natural
philosophers since ancient times.
Nowadays, symmetry means group
theory, and that could be added to the
list of prerequisites too.

Particle physicists are faced, therefore,
with having to understand and
then communicate such a complex
subject, which is highly mathematical.
In such a situation, which seems
rather typical of modern physics, the
would-be communicator has a choice
to make: should he concentrate on
the mathematics, eschewing the
telling "it can be shown that", or
should he steer clear of a too formal
approach, and aim to deal mainly
with physical illustrations, analogies,
and plausible or heuristic arguments,
leaving the mathematics to be
worked out by the reader, or should he
attempt some kind of compromise?

Professor Huang inclines fairly
firmly to the mathematics. "This
book," he says in his preface, "is a
concise introduction to the physical
motivation behind these ideas (gauge
theories), and precise mathematical
formulation thereof." It begins with
a very brief survey of particles and
interactions, and continues with a
summary of some of the important
evidence for quarks, and some "do-
it-yourself" group theory relevant for
their symmetries. The mathematical
formulation of gauge theories is then
treated algebraically, gauge fields being
introduced to begin with.

A succinct discussion of electro-
magnetic gauge theory includes the
Goldstone and Higgs phenomena,
flux quantization, and vortex
lines. Non-abelian gauge theories
follow, with a useful mention of parallel
displacement in this context, and
of Yang's non-integrable phase
factor approach. A chapter on topol-

logical solitons comes next, containing
useful material on instantons,
monopoles and the phenomenon of
"spin from isospin". Then a brisk
review of the Glashow-Salam-Wein-
berg model is offered, in tree approx-
imation. Chapter seven embarks on
path integral quantization, which is
applied to gauge theories in chapter
eight, following the Faddeev-Popov
method. Several gauges are discussed
explicitly, and there is also a useful
section on θ -vacua and instantons.
Renormalization gets slightly more
(26 pages) than its average allotment
(23 pages), but it certainly is, as even
the author finds room to say, "highly
compressed". The remaining chapters
treat the effective potential, the axial
anomaly (a clear and up-to-date
account), and some aspects of
quantum chromodynamics.

This is a wide range of advanced
topics, all of them undoubtedly re-
levant, many notoriously difficult –
to cover in 276 pages. It can be
done at all only by using, almost
exclusively, the powerful and com-
pressed notations of mathematics.
But is this the best way to impart
understanding? The answer may well
vary with the individual student but,
for myself, I think that for a rounded
understanding of the physical world
we need both kinds of symbols: those
of human language and those of
mathematics. Admittedly, it is
often hard to express physical truths
accurately and concisely in words.

Professor Huang seems to regard
the use of words in any kind of
quantity as a reprehensible failing. In
his preface he apologizes for the fact
that he has not found it possible to
discuss "quark confinement" in a
"sufficiently concise yet intelligible
style". I am not sure where the de-
mand for "sufficient" concision arises
from, especially as it affects a book
as opposed to a research article. He
is here obviously aware of the danger
that too much compression will make

things difficult for the reader. But he
goes on: "The length of exposition
usually increases with lack of under-
standing. Rather than make a poor
attempt, I have omitted it entirely."
This is a very stern view. There is
surely no intrinsic virtue here in
brevity. For example, it is rather
extraordinary to read, after a mathe-
matical introduction to the "gauge
principle", that "it merely determines
the form of coupling between the
matter field and the gauge field". Is
this quite the right impression to
leave?

I would have expected a book at
this level to have introduced and
used the technique of dimensional
regularization, and to have included
some discussion of the Slavnov-
Taylor identities. It is also dis-
appointing that no room could be
found for even a short introduction
to SU(5), or any other "grand uni-
fied theory", since the possibility of
the eventual unification of all the
forces is a major reason for the in-
terest in gauge theories. And I am
surprised that the "code" was not
mutated in the crusade for concision
– especially if its removal could
have made room for a better
index, or for a list of references.

There are some minor blemishes,
for example, to say that "quarks are
assumed to be baryons" is surely
confusing. Nevertheless, there is no
doubt that much useful mathematical
material in this book, and its overall
approach to the subject – via the
classical fields, path integral quan-
tization, and then renormalization –
is certainly clear and logical. Its
digestibility for the individual will
depend a lot on his or her mathe-
matical and physical tastes.

Ian Aitchison

Ian Aitchison is lecturer in theoretical
physics at the University of Oxford.

What is
a tensor?

Cartesian Tensors, with applications
to mechanics, fluid mechanics and
elasticity
by A. M. Goodbody
Ellis Horwood: Wiley,
£26.50 and \$9.95
ISBN 0 85312 220 2 and 377 2

Some mathematical tools required in
particular applications are best intro-
duced as part of a lecture course
dealing with that specialization;
others are commonly taught as part
of a course on mathematical
methods, including a number of iso-
lated topics. A third possibility is to
build a course around the topic itself,
including the applications, which is
the option on which Dr Goodbody
has based this book.

An introductory chapter on vec-
tors and matrices is followed by the
core chapter in which second-order
tensors are defined and the theory
developed. Two chapters follow, ge-
nerating the theory to higher-order
tensors. Then follow chapters dealing
with the use of Cartesian tensors in
mechanics, fluid dynamics, and elas-
ticity. The remaining main applica-
tions of tensors, to relativity, require
general tensors, and so is not in-
cluded in this book, although an
appendix is included in which a brief
account of the general theory is pre-
sented.

The pace of the book is leisurely,
and the material is well-presented.
There are a large number of worked
examples and exercises. Answers to
the problems are given, and the
book ends with a bibliography and
index.

Although the book may well be
helpful to those who wish to refresh
their memory of a particular aspect
of the subject, I am not convinced
that the philosophy behind the book
is correct. It is a textbook, a topic
which merits nearly three hundred
pages? In *Methods of Mathematical
Physics*, Jeffreys and Jeffreys cover
much the same material in under
thirty pages. Some of the extra space
taken up by matters having no
bearing on tensors as such, such
as the various types of tensors, which
are merely exercises in the evalua-

tion of multiple integrals. It is im-
portant to make the topic relevant
while it is being taught, if possible.
The difficulty is that often a knowledge
of, for example, fluid dynamics is
required to understand the use of
tensors, and yet a student who has
this knowledge will almost certainly
have met tensors while learning it.
On the other hand, a complete intro-
duction to fluid dynamics as part of
a course on Cartesian tensors is not
practical.

Apart from this general criticism
of the author's aims in writing this
book, I have two specific objections.
The important result of the symme-
try of the stress tensor in fluid dyna-
mics is given a "proof" which is
based on the idea that the integrand
must be zero if the integral over a
vanishingly small domain is zero.
A more serious objection concerns
the definition of a tensor. It is not
easy to give a satisfying definition
which students meeting tensors for
the first time will appreciate. The
approach in Jeffreys and Jeffreys is
not satisfactory; they define a tensor
by the way in which it transforms on
rotation of axes. The introduction of
tensors by way of linear vector func-
tions of vectors is much more satis-
factory, and this is the approach used
in this book. However, it is vitally
important that the distinction be-
tween a "function", or mapping, and
the "value" of that function be made
clear. There must then follow the
difficult conceptual step of identify-
ing the function with a physical
quantity, a tensor. I do not think
that the author has made these dis-
tinctions sufficiently clear. I can easily
imagine students becoming very
confused and asking "What exactly is
a tensor?"

L. M. Hocking

L. M. Hocking is professor of
mathematics at University College
London.

Van Nostrand Reinhold have pub-
lished a second edition of A. O.
Morse's *Linear Algebra: an introduc-
tion* at £4.75.

Edwin Hubble's *Silliman Foundation
Lectures*, originally published in
1936, have been re-issued with a
foreword by James E. Gunn, as *The
Nebulae of the Universe* by Yale Uni-
versity Press at £25.00.

BOOKS
MATHEMATICS
AND PHYSICSThe new
physics

An Introduction to Gauge Theories
and the "New Physics"

by Elliot Leader and Enrico Predazzi
Cambridge University Press,
£35.00 and £15.00
ISBN 0 521 23375 5 and 29937 3

Thirty years ago the interactions
among elementary particles seemed
to be of four distinct kinds. There
was the familiar gravitational interac-
tion between all forms of matter.
There was the electromagnetic in-
teraction between charged particles,
such as the electron and the proton,
which leads to the formation of
atoms, molecules and all the normal
forms of matter. There was the
strong interaction between "had-
rons", such as the protons and neu-
trons, out of which atomic nuclei are
consequently formed. And there was
the weak interaction which gives rise
to nuclear β -decay.

The first two interactions were
well understood. Electromagnetism
was described by Maxwell's field
theory of 1864, and its quantized
version, in interaction with electrons
(quantum electrodynamics), had just
been cast in a form which allowed it
to be verified in certain crucial ex-
periments to a very high degree of
precision. Gravitation too had re-
ceived a field theoretic formulation
at the hands of Einstein in 1916. The
two classical field theories have a
common feature – "local symmetry":
for gravitation it is a local version of
the homogeneity and isotropy of
space-time; for electromagnetism it is
a local version of a more recent
symmetry from which charge con-
servation follows. For historical
reasons such a local symmetry has
become known as a gauge invariance
and field theories modelled on Max-
well's theory are known as gauge
theories.

The strong and weak interactions
seemed to be totally different. Un-
like the two classical forces, which
both obey an inverse square law,
they were found to be of very short
range – perhaps zero for the weak
force. Attempts to formulate field
theories of these interactions were
initially unsuccessful, in the one case
because the strength of the force
rendered calculations impracticable,
in the other because the quantum
theory of the appropriate contact
force was inconsistent. It became
fashionable to believe that the field
theoretic formulation of particle in-
teractions had failed and must be
replaced by one based on the scatter-
ing matrix.

During the past decade all this has
changed. It is now widely believed
that gauge theories account for all
the fundamental forces. How this
should (or counter-revolution as it
might be called) came about, and
the basis for current beliefs, is the
subject-matter of Leader and Predazzi's
book. The story involves a com-
plex mixture of theoretical and ex-
perimental developments.

On the theoretical side, it became
evident about twenty years ago that
gauge theories were more versatile
than had previously been realized:
they can give rise to short range
forces, at least when dynamical
effects known as spontaneous sym-
metry breaking occurs. This feature
was incorporated in the theory of
Glashow, Salam and Weinberg which
unified the weak and electromagnetic
interactions. Ten years ago (follow-
ing the proof by 't Hooft of the per-
turbative consistency of the per-
turbative expansion of gauge
theories, without which theoretical
confidence in their viability had been
lacking), evidence of new weak in-
teraction processes predicted by the
theory began to be found: a few
years ago more dramatic confirma-
tion came with the announcement at
CERN in Geneva of the discovery of
the W-boson (a partner of the
photon) with the predicted mass.

On the experimental side, a crucial
development in strong interaction
physics was the discovery at the
Stanford Linear Accelerator (SLAC)
in California in 1968 of pointlike sub-
structure of protons and neutrons
which, by confirming the broad fea-
tures of the quark model (Murray
Gell-Mann and G. Zweig, 1964),
shifted attention from the interaction
of nucleons to the interaction of
quarks. Following on the first suc-
cesses of the electroweak gauge theory
in 1973 it was proposed that quark
interactions might also be de-
scribed by a gauge theory
(quantum chromodynamics). It was
found that such a theory predicted a
weakening of the effective interaction
strength with increasing energy; as a
consequence, if a fourth "flavour" of
quark existed in addition to the three
needed to account for the known
hadrons (as was required for the
consistency of the electroweak gauge
theory), this more massive
"charmed" quark with its antiparticle
would form weakly bound states
rather similar to the Bohr levels of a
hydrogenic atom.

It was the discovery in autumn
1974 at Brookhaven and at
SLAC of mesons (the J/ψ family),
with just the properties which these
gauge theories implied, that inaugu-
rated the "new physics", to which
this book is principally devoted.
What was new about the "new physics"
was, paradoxically, that it was
surprisingly (to physicists brought up
on the hadron physics of the fifties
and sixties) like the old physics of
atomic systems.

phenomenology of the "new physics"
to experimental developments.
However, they do not attempt – it
would not have been reasonable in a
book of this kind, which is not aimed
primarily at theoreticians – to derive
very deeply into the underlying
quantum field theory. They depend
heavily on the older texts by D. J.
Bjorken and S. D. Drell (*Relativistic
Quantum Mechanics and Relativistic
Quantum Fields*, McGraw-Hill, 1964
and 1965) for the provision of this
background.

These more theoretical chapters
are consequently the weakest, for
they occasionally use recent theoret-
ical jargon without adequate ex-
planation (an example is the two
different kinds of "ghost" which
haunt pages 350 to 353; a newcomer
to the non-abelian Feynman rules
might well be mystified). Their
account of the parton model follows
closely the lines of an earlier text.
They are at their best in their com-
prehensive presentation of the phe-
nomenology of the "new physics",
which I take to be the raison d'être
of the book. This alone would make
it a valuable addition to the book-
shelf of the student (or teacher) of
particle physics. And the simulta-
neous publication of hardcover and
paperback editions makes up for the
inordinate number of errors which,
as a bound-in errata slip confesses,
were introduced during type correc-
tions.

P. W. Higgs

P. W. Higgs is professor of theoretic-
al physics at the University of Edin-
burgh.

Dynamical
systems

Introduction to Dynamics

by Ian Percival
and Derek Richards
Cambridge University Press,
£18.50 and £7.95
ISBN 0 521 23680 0 and 28149 0

This book has celestial origins. Many
famous mathematicians claimed to
have proved the stability of the solar
system. Because Dirichlet (1805-
1859) died before writing down his
proof, King Oscar of Sweden offered
a prize for its discovery, and this was
awarded to Poincaré in 1899. Poin-
caré's work, which initiated the
neo-qualitative phase of dynamics,
emphasized the global geometric
point of view and relatively recently
gave rise to the work of Smale and
Kolmogorov on dynamical systems.
The authors of this splendid textbook
have made a commendable effort to
introduce the geometric and qualita-
tive aspects of dynamics at an under-
graduate level. In fact, their book
presupposes little more than A level
mathematics.

The main thrust of the book is
towards the phase-plane analysis of
Hamiltonian systems. Chapter one
introduces phase-plane concepts for
first-order autonomous systems.
Chapter two studies linear trans-
formations of the plane, particularly
shears, dilations and area-preserving
transformations. As a vehicle for in-
troducing integrals of motion and the
two-dimensional phase-plane, chapter
three deals with second-order
autonomous systems. The traditional
classification of equilibrium points of
linear systems (constant coefficients)
is also given. The computations here
can be simplified by use of the
Cayley-Hamilton theorem which is
trivial for two-by-two matrices. More
seriously, there should have been a
warning that linearization about an
equilibrium point does not always
determine behaviour in its neigh-
bourhood. Easy examples could be
given to show this.

Chapter four is concerned with
conservative Hamiltonian systems
with one degree of freedom, area-
preserving flows and Liouville's
theorem. There is a good discussion
of the motion of particles moving
under various potentials. In chapter
five, on Lagrangian mechanics, the
transformation invariance of the Lag-
range equation is not discussed but
consigned to an exercise.

The study of transformation theory
and of generating functions of can-
onical transformations in chapter six
leads naturally to action-angle vari-

ables. However, some care ought to
be exercised here when constructing
transformations by integrating round
curves in a phase-space which is not
simply connected. This theory is ap-
plied to action-angle variables in
chapter seven.

Chapter eight introduces the
theory of conservative systems with
perturbed Hamiltonians. This leads
in the next chapter – on adiabatic
and rapidly oscillating conditions – to
the slow and fast time-dependent
perturbations of conservative sys-
tems.

Chapter ten returns to linear sys-
tems but now with time-dependent
coefficients. The theory expounded
here is based on propagators for one-
dimensional and two-dimensional
systems. There is a need here for a
more careful definition of what
"phase-space" means for time-depen-
dent systems and for what "solution"
means for systems with discontinuous
coefficients or forcing terms. The
chapter includes some theory of
periodic forces and parametric reso-
nance.

The final chapter – on chaotic
motion and non-linear maps – intro-
duces discrete-time systems. The logic
of the chapter is in population
dynamics, which is studied in some
detail. There follows a discussion of qua-
dratic area-preserving maps and chaotic
motion in Hamiltonian systems. To
complete the picture, the authors
might have mentioned the Poincaré-
Birkhoff theorem on fixed-points of
an area-preserving mapping of an
annulus, a little on KAM theory, and
the remarkable result of Markus that
most smooth Hamiltonian systems
with at least two degrees of freedom
exhibit *quasi-periodic* chaos.

Introduction to Dynamics is an ex-
cellent, well-organized book with
many illuminating worked examples,
a course based on this book would
be a pleasure to teach. It should be
greatly appreciated by physicists and
engineers, and might help bring ap-
plied mathematicians forward into the
nineteenth century.

J. P. Cleave

J. P. Cleave is reader in mathematics
at the University of Bristol.

*The Collected Papers of J. E. Little-
wood* have been edited by a commit-
tee (headed by J. W. S. Cassle)
appointed by the London Mathemat-
ical Society and published in two
volumes by Oxford University Press
at £60 each volume. The papers have
been grouped as follows: differential
equations; real analysis; the zeta
function and number theory; com-
plex analysis; probabilistic analysis;
unclassified mathematics and miscel-
laneous.

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WILEY

FUNCTIONAL ANALYSIS

by Harro G. Heuser, University of Karlsruhe, Federal Republic of Germany
Translated by John Horvath, University of Maryland

This revised version of the original German edition contains the basic
concepts, the essential statements and the main methods of functional
analysis. The book emphasizes the link between the abstract theory and
practical applications and includes an extensive bibliography.
0471 2805

BOOKS

MATHEMATICS AND PHYSICS

Probable or random

Probability and Random Processes by G. R. Grimmett and D. R. Stirzaker
Oxford University Press, £20.00 and £9.95
ISBN 0 19 853 184 2 and 185 0

Although it competes with a very large number of other books on similar topics, this new textbook on probability and stochastic processes should quickly become established as one of the best texts available at undergraduate or MSc level. Grimmett and Stirzaker hope that their book will be suitable for mathematics undergraduates at all levels. They also intend that it should be a useful reference for graduate students and others with interest in probability and its applications, and give the beginner a taste of more advanced work. The authors have attempted to provide not only a rigorous introduction to probability theory without burdening the reader with a great deal of mea-

sure theory, but also a discussion of random processes in some depth with many examples, including topics not often taught at this level. It is much to the authors' credit that their aims have largely been achieved. The early chapters of the book cover the basic material (probability of events, discrete and continuous random variables, generating functions, laws of large numbers) that appears in most introductory courses on probability. These chapters are ideally suited to students approaching probability theory after attaining a reasonable competence in elementary pure mathematics. Thus, in spite of the meticulous care with which definitions are motivated and explanations are given, the treatment is not really suitable for the majority of students who follow such courses in their first year, when they are unlikely to possess the basic mathematical knowledge assumed. Such students would, nevertheless, benefit greatly from reading these early chapters before attempting a course in stochastic processes.

Several chapters later in the book cover the material commonly found in undergraduate courses on stochastic processes (Markov chains and processes, queues and renewal processes), and these constitute an excellent text for such courses. There are also two nice chapters on topics which are rarely taught at undergraduate level — one on convergence of random variables including an introduction to martingales, and the other on stationary processes (spectral representation, ergodicity) and diffusions. The style throughout is attractively

conversational. In one place, before a multiple conditioning argument for a branching random walk, the reader is told "hold your breath" and later "now breathe again", but such informality is sufficiently infrequent that it is pleasant rather than irritating. The book will appeal particularly to the more able student, undergraduate or postgraduate. For such a student nothing is more infuriating than the approach of many introductory texts which use heuristic arguments and leave the reader with no idea of how these may be made rigorous or even, in some cases, why the arguments are not themselves rigorous. Grimmett and Stirzaker never abandon their readers in this way, pointing out clearly where and why problems exist and how the reader might attempt to resolve them without ever getting sucked into a quicksand of measure theoretic detail. Finally, each chapter sports a useful set of associated problems; and solutions and remarks about these are given at the end of the book.

Valerie Isham

Valerie Isham is lecturer in probability and statistics at University College London.

Atomic theory

Physics of Atoms and Molecules by B. H. Branden and C. J. Joachain
Longman, £12.50
ISBN 0 582 44401 2

This is very much a theorist's view of atomic physics. The authors are professors of theoretical physics at Durham and Brussels respectively and both have already published books on collision theory. The student will therefore expect to find an authoritative account of the subject; and, apart from a few minor blemishes, he will not be disappointed. The authors' aim is "to present a unified account of the physics of atoms and molecules from a modern viewpoint, in adequate detail, but keeping within the undergraduate framework". They suggest that it is suitable for study in the penultimate or final year of an undergraduate course following some study of elementary quantum theory.

After the customary introductory chapter on the development of atomic physics up to 1927, there is a 70-page review of what the authors rather modestly call the "elements" of quantum mechanics. The treatment is mainly couched in the language of wave-mechanics, although Dirac notation is used in the fairly substantial section on approximation methods. A more sophisticated treatment of angular momentum theory, using methods of operator algebra, is summarized in an appendix and the results stated there are freely used in later parts of the book.

The main body of the book begins with an excellent discussion of hydrogenic atoms, including exotic atoms, followed by a rather terse statement of the theory of their interaction with radiation. A useful feature is the inclusion of a section on photo-ionization in which the differential cross-section is derived for hydrogenic systems. The fine structure as well as the Zeeman and Stark effects are covered in a single fairly long chapter, parts of which are not light reading.

The discussion of two-electron atoms and the relation between spin and symmetry is particularly clear and helpful, and the same can be said of the account of the independent particle model. The variational method is applied to excited states as well as to the ground state and there is a short but interesting discussion of auto-ionizing states. The structure of many-electron atoms and their interactions with radiation are dealt with in successive chapters, the former at some length because of the inclusion of a substantial exposition of Hartree-Fock theory, with examples.

The topics of molecular structure and spectra are given two chapters which, taken together, are only a little longer than a single chapter on many-electron atoms. Not surprisingly, such a treatment does little

more than state the main facts. However, the problems of hydrogen and its positive ion are discussed in some detail, as is the inversion phenomenon in ammonia. In view of the known interests of the authors, the emphasis on electronic and atomic collisions was to be expected. In three substantial chapters they review standard partial-wave theory, potential scattering, electron-atom scattering, and atomic collisions. The exposition is primarily of the theory; experimental methods receive only the briefest mention, although comparison is made with experimental results wherever appropriate.

The final chapter, on applications of atomic physics, is the only one in which experimental work comes to the fore. Symptomatically this is the weakest chapter in the book. There are errors of omission and commission especially in relation to magnetic resonance and lasers. This is the experimental physics "of Stratford-atte-bowe" and, with the possible exception of the discussion of thermonuclear fusion, no great loss would have been occasioned by its omission.

Following each chapter there is a set of problems, answers to many of which are given in an appendix. The authors have succeeded in presenting a modern and comprehensive account of atomic physics, though clearly from a theoretical physicist's standpoint. Both the physical and mathematical level seems to me to place the book firmly in the context of final honours for most students; indeed, it might well form the basis for a first course at postgraduate level.

A. G. A. Rae

A. G. A. Rae is senior lecturer in physics at the University of Edinburgh.

Algebraic topology

Surface Topology by P. A. F. Kirby and C. F. Gardiner
Ellis Horwood, Wiley,
£19.50 and £6.90
ISBN 0 85312 483 3 and 518 X

Algebraic topology must seem quite inaccessible to the novice. To begin, you need both algebra and topology. General topology is a rather dull subject, usually approached via the theory of metric spaces, and this you will not understand unless you have studied analysis of the real line, which in turn presupposes that you have A-level calculus at your fingertips.

For the algebra, you will need to know some group theory, not all of it entirely elementary. Of course, an experienced mathematician will not need to learn such a subject in the "right" order, but will pick up what background material he needs as he goes along. But what of the young and inexperienced? How are we to encourage them to start what is a lengthy and painful learning process?

Now topology is in the fortunate position that many of its theorems are very pretty and, though deep, are none the less easy to explain in non-technical terms. So Kirby and Gardiner's idea is to provide a tour of some of these results, making the known a little school algebra and every mention of analysis, has been cut out; so that technically the book is understandable. And it does get to compact surfaces, classification of embedding graphs in surfaces, and index theorems. The hope is that the reader will afterwards be better equipped to begin the long struggle to learn the subject in full technical detail, or at least that he will have gained some insight into what it is that topologists do.

Does the book achieve its aims? I have to admit that I have my doubts. The publishers say the book is a "rigorous treatment" which plainly it is not, and I would be happier with it if it repeatedly said "this heavy type, look, we're not doing this properly, we're just trying to give you an

idea." It is based on a course given by the authors, and with a lively and sceptical class, such a course could work well. But in cold print it is less successful, and time and again I feel that I was being cheated.

For example, after a brief mention of manifolds, the authors abandon this approach and define a compact surface to be a plane polygonal region with its edges identified in pairs. This has the advantage of being just what they need to make the classification theorem work, but it is very unnatural. After describing the usual scissors-and-paste operations on these surfaces, they then need to show that homeomorphic surfaces have the same Euler characteristic, so they define a homeomorphism to be nothing more or less than the result of their game with the scissors-and-paste. And the reader now thinks he knows what a homeomorphism is, when in truth he may not even know the meaning of continuity.

There are some technical faults, too. A vital part of the definition of "group" is missing, and in some diagrams an arrow, of all things, is used to attach the name of a vector to the arrow representing it. The two theorems in the penultimate chapter are wrong, but by then the reader will be so used to taking everything on trust that he probably won't notice. In the first of the theorems, a distance has been calculated too crudely, and is wrong. In the second, the authors seem to imagine that it is possible to construct a least common multiple of a finite set of real numbers; any first-year student could tell them why that is nonsense.

John Silvester

John Silvester is lecturer in mathematics at King's College, London.

MIT Wavelength Tables Vol 2: Wavelengths by Element

editor by Frederick M. Phelps III

In 1939 George Harrison published his classic *Wavelength Tables*, the major strength of which were the consistency of the conditions under which measurements were taken. (MIT's edition published in 1989 is still available at £48.00.) The second volume *MIT Wavelength Tables* presents a rearrangement of Harrison's spectrum lines by element rather than by wavelength. It also includes wavelengths in vacuum and corresponding wave numbers, which are important for theoretical studies. The volume will be useful to analytical chemists, atomic spectroscopists, astronomers and others who need accessible and comprehensive summaries of data compiled by a given element. February 1983, £52.00.

FUSION Science, Politics & the Invention of a New Energy Form

by JOAN LISA BROMBERG

For over 30 years the prospect of unlimited fusion energy has attracted scientists and the public. This book documents the history of the American magnetic fusion reactor program from its inception in 1951, with the intermingling of science and politics demonstrated in specific details. Fusion concentrates on the four federally-funded laboratories: Oak Ridge, Los Alamos, Lawrence Livermore, and Princeton. It recounts the crucial experiments along the way and explains the various magnetic configurations and devices: the "stellarator", the "pinch", the "tokamak". The fusion reactor project is, of course, ongoing. Latest target date for producing commercial power, 2050; estimated total cost, \$16 billion. December 1982, £24.00.

Pseudo-Differential Operators

by HITOSHI KUMANO-GO

Translated by the author, Reim Vellentein and Shiro Nagase
This is a self-contained and comprehensive exposition of the theory and applications of pseudo-differential operators, the only prerequisite being a solid background in calculus. November 1982, £48.00.

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The MIT Press
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NOTICE BOARD

Honorary degrees

Open University

Honorary doctorate Professor Basil Bernstein, head of the University of London's sociological research unit; Dr Viktor Brailovskii, Russian mathematician; Dame Elisabeth Frink, CBE, sculptor; Hamish Henderson, poet, scholar and songwriter; Ted Hughes, OBE, poet; Dr Christopher Isherwood, novelist, playwright, journalist and broadcaster; Professor Sir George Porter, CBE, president of the Royal Society and director of the Institution for Biological Sciences; Dr William Taylor, director of the University of London's Institute of Education; Rt Hon George Thomas, PC, Speaker of the House of Commons; Malcolm Williamson, Master of the Queen's Music.

Mai John Boon, CBE, chairman of publishers, John and Bony, Hilary Davison Weston, director of studies, St Paul's Girls' School, London; Neil Edgar, principal education officer, State Hospital, Carlisle; James Eichel, divisional principal, Norton/Woodwards Division of Adult Education, York; Peter Hewitt, a pioneer of distance learning; R. F. Mackenzie, headmaster, Summerhill Academy, Aberdeen; Audrey Newson, academic counsellor and past president of the British Association for Counselling; Brian Rix, former actor, secretary-general of MENAPCA; Willy Russell, writer and theatrical lecturer; Reverend Robert Rynken, William, poet, playwright, novelist and broadcaster.

Chairs

The University of Durham has appointed Dr Kenneth Wade to a personal chair in chemistry and Dr Karl Heinz Kohn to a personal chair in optics.

Professor Andrew George Lehmann, director of the Institute of European Studies, University of Hull, has accepted the appointment to the Chair of European Studies and Director of the Language Centre at the University College of Bedfordshire. Dr David Bernard Casson, Barrister-at-Law, has been appointed to the Rank Foundation Chair of Law at UCL.

The University of Kent has conferred the title of honorary professor of chemistry upon Professor R. L. Walsby FRS and the title of visiting professor in ecology on Professor Martha Gilman, associate professor at the University of Colorado.

Open University programmes Saturday March 19 to Friday March 25

Saturday March 19

6.00 Breakfast Early Life: Tracks and Traces (S344; prog 4)
6.30 Science Foundation Course: Rocks and Magnets (S101; prog 2)
6.45 Science Foundation Course: Gaining It Together (S102; prog 3)
7.00 Science Foundation Course: Doing Your Own Thing (S103; prog 4)
7.15 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.30 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.45 Science Foundation Course: The Industry and the Environment (S104; prog 5)
8.00 Science Foundation Course: The Industry and the Environment (S104; prog 5)

Sunday March 20

6.00 Breakfast Early Life: Tracks and Traces (S344; prog 4)
6.30 Science Foundation Course: Rocks and Magnets (S101; prog 2)
6.45 Science Foundation Course: Gaining It Together (S102; prog 3)
7.00 Science Foundation Course: Doing Your Own Thing (S103; prog 4)
7.15 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.30 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.45 Science Foundation Course: The Industry and the Environment (S104; prog 5)
8.00 Science Foundation Course: The Industry and the Environment (S104; prog 5)

Monday March 21

6.00 Breakfast Early Life: Tracks and Traces (S344; prog 4)
6.30 Science Foundation Course: Rocks and Magnets (S101; prog 2)
6.45 Science Foundation Course: Gaining It Together (S102; prog 3)
7.00 Science Foundation Course: Doing Your Own Thing (S103; prog 4)
7.15 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.30 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.45 Science Foundation Course: The Industry and the Environment (S104; prog 5)
8.00 Science Foundation Course: The Industry and the Environment (S104; prog 5)

Tuesday March 22

6.00 Breakfast Early Life: Tracks and Traces (S344; prog 4)
6.30 Science Foundation Course: Rocks and Magnets (S101; prog 2)
6.45 Science Foundation Course: Gaining It Together (S102; prog 3)
7.00 Science Foundation Course: Doing Your Own Thing (S103; prog 4)
7.15 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.30 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.45 Science Foundation Course: The Industry and the Environment (S104; prog 5)
8.00 Science Foundation Course: The Industry and the Environment (S104; prog 5)

Wednesday March 23

6.00 Breakfast Early Life: Tracks and Traces (S344; prog 4)
6.30 Science Foundation Course: Rocks and Magnets (S101; prog 2)
6.45 Science Foundation Course: Gaining It Together (S102; prog 3)
7.00 Science Foundation Course: Doing Your Own Thing (S103; prog 4)
7.15 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.30 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.45 Science Foundation Course: The Industry and the Environment (S104; prog 5)
8.00 Science Foundation Course: The Industry and the Environment (S104; prog 5)

Thursday March 24

6.00 Breakfast Early Life: Tracks and Traces (S344; prog 4)
6.30 Science Foundation Course: Rocks and Magnets (S101; prog 2)
6.45 Science Foundation Course: Gaining It Together (S102; prog 3)
7.00 Science Foundation Course: Doing Your Own Thing (S103; prog 4)
7.15 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.30 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.45 Science Foundation Course: The Industry and the Environment (S104; prog 5)
8.00 Science Foundation Course: The Industry and the Environment (S104; prog 5)

Friday March 25

6.00 Breakfast Early Life: Tracks and Traces (S344; prog 4)
6.30 Science Foundation Course: Rocks and Magnets (S101; prog 2)
6.45 Science Foundation Course: Gaining It Together (S102; prog 3)
7.00 Science Foundation Course: Doing Your Own Thing (S103; prog 4)
7.15 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.30 Science Foundation Course: The Industry and the Environment (S104; prog 5)
7.45 Science Foundation Course: The Industry and the Environment (S104; prog 5)
8.00 Science Foundation Course: The Industry and the Environment (S104; prog 5)



"An Allegory of Hygiene": a typical grandiose and dramatic piece of German social propaganda. This 1912 etching by Max Klinger — with its prophetic hints of the racism that was to lead German society to the 1930s — is among the more striking pieces on show at an exhibition of German Prints at the Wellcome Institute for the History of Medicine, Euston Road, London, NW1.

Appointments

Colleges

Humboldt College of Higher Education has appointed Dr Peter Slegers, barrister and chairman of the Executive Committee of Justice and David Waddington, QC, MP, Minister of State at the Home Office. Sir Norman Lindop, Chairman of the Committee on Data Protection, will be in the chair.

General

Dr Alan Matterson, formerly deputy director of Kingston Polytechnic, has been appointed assistant chief officer of the Council for National Academic Awards.

Forthcoming Events

The University of Education Continuing Education Unit

is holding a one-day conference on Data Protection on Wednesday May 11. Speakers will include Paul Slegers, barrister and chairman of the Executive Committee of Justice and David Waddington, QC, MP, Minister of State at the Home Office. Sir Norman Lindop, Chairman of the Committee on Data Protection, will be in the chair.

The Leverhulme follow-up seminar on "Finance, Government and Structure"

will be taking place on March 21 at the Polytechnic of Central London.

Grants

Bristol

Physiology: Dr B. M. H. Bush, £41,665 from the Science and Engineering Research Council towards an investigation of neural integration of non-spiking and other low frequency inputs and central motor patterns in crustacea. Microbiology: Dr P. M. Bennett, £36,500 from the SERC towards an investigation of site-specific recombination encoded by B46. Physical chemistry: Professor R. H. Ottewill, £22,424 from the SERC towards an investigation of the direct measurement of surface forces; Professor D. H. Everett, £17,580 from the Commission of the European Economic Community towards an investigation of determination of surface area of seven candidate reference materials.

Theoretical chemistry: Dr G. G. Balint-Kurti, £23,850 from the SERC towards an investigation of quantum theory of simple chemical reactions; Dr G. O. Balint-Kurti, £10,874 from the Daresbury Laboratory towards an investigation of heavy particle dynamics CCP 4. Inorganic chemistry: Dr M. J. Green, £19,950 from the SERC towards a study of the organotransition metal chemistry of small ring compounds. Biochemistry: Dr N. L. Brown, £62,780 from the Medical Research Council for an investigation of gene expression in the mercury-resistance transposon Tn501; Dr H. Gullstrand, £30,000 from the Muscular Dystrophy Association as a supplementary grant towards an investigation of the resolved heat measurements on reactions of muscle proteins; Dr M. J. A. Tanner, £37,720 from the Wellcome Trust towards an investigation of the structure of the human erythrocyte receptors P. falciparum malaria.

Physiology: Dr D. J. Dingley, £11,726 from the SERC towards a study of diffraction from sub-micron particles in an SEM using image intensification of EBSPs; Professor J. E. Enderby, £10,000 from the SERC towards a mass spectroscopic investigation of the chemical and ultrastructural stability of resins, resin based adhesives and composites. Civil engineering: Dr D. I. Blockley, £23,768 from the SERC towards an investigation of engineering failures; a social/technical assessment of the safety of construction projects. Pathology: Dr A. B. Rickinson, £53,083 from the Medical Research Council towards an investigation entitled "Analysis of HLA-A and -B antigen polymorphism by Epstein-Barr virus specific cytotoxic T cells."

Biological sciences: Professor S. D. N. Grimshaw, £15,257 from the Department of the Environment (Building Research Establishment) for investigation of attitudes to safety in the construction industry, public and private sector. Biological sciences: Dr S. Hunt, £17,886 from the Arthritis and Rheumatism Council for a study of counter-distribution and dynamic interaction of articular cartilage; Dr S. Hunt and Dr H. Huddart, £34,906 from the Natural Environment Research Council for investigation of the physiological, biochemical and ultrastructural role of calcium in the gills of freshwater teleosts and arthropods with respect to survival at low pH; Professor T. A. Mansfield, £35,000 from the European Economic Community for investigation of the influence of environmental factors on pollution responses of grasses; Dr A. R. Walling, £17,000 from the SERC for assessment of the likely concentration of the toxic products from SO₂ and NO_x fumigations of plants at their site of action.

Biological sciences and chemistry: Professor T. A. Mansfield and Dr A. Thomson, £27,583 from the Agricultural Research Council for study of stomatal responses to ABA IAA synthetic analogues and CO₂. Chemistry: Dr J. R. Ebdon and Dr B. J. Hunt, £20,650 from British Aerospace for studies of thermosetting resins.

RADIO 4 (VHF)

22.30 The Imaginative Century Poetry and the First World War (A206; prog 3)

22.30 Religious Quest: Devotional Meditations (A206; prog 3)

Friday March 25

8.00 Mathematical Models and Methods: Springs (M3194; prog 7)

8.00 The Earth: Structure, Composition and Evolution: Crust and Mantle (D237; prog 3)

8.00 Thermodynamic Mechanics and Energy: Carnot and Sadi Carnot (D237; prog 3)

7.30 Statistics: An Interdisciplinary Approach: The Binomial Distribution (MD174; prog 3)

7.40 Evolution: Early Life: Tracks and Traces (S344; prog 4)

17.10 Mass Communication and Society: The Anchor Booth (D231; prog 3)

17.15 Weekend Outlook - 7

RADIO 3 (VHF)

8.15 The Enlightenment: Batty Langley (A204; prog 3)

8.15 The Enlightenment: A Changing Culture: Portraits from 1700 to 1800 (A204; prog 3)

8.15 An Introduction to Calculus: What is a Function? (M3194; prog 7)

22.40 Instrumentation: Magnetic Circuits (T291; prog 2)

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Courses

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Further details from the Registrar at the above address. Tel: 0761 62503.

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Application material available from the Personnel Office, The National Institute for Higher Education, Plassy Technological Park, Linenick, Ireland, should be completed and returned by 8 April, 1983.

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Department of Health and Nutrition

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For further information contact: Professor R. A. Stammers, Department of Health and Nutrition, University of New England, Armidale, NSW 2351, Australia. Tel: 0677 524181.

SALARY: £4,425-£5,430 p.a. inc. pension.

Closing date: 31 March 1983. Commence: 1 June 1983.

Position No: 413.

Applications, including curriculum vitae and references, should be sent to the Staff Selection Committee, c/o the University of New England, Armidale, NSW 2351, Australia. The closing date for applications is 31 March 1983. Successful candidates will be invited for an interview at the University of New England.

University of the South Pacific

Applications are invited for

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Applicants should have a minimum of five years' experience in the field of accounting and be able to teach at University level. The post is available from 1 September 1983. Salary: £12,000-£14,000 p.a. (inc. pension).

The post is available from 1 September 1983. Salary: £12,000-£14,000 p.a. (inc. pension).



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University College Cork

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Application forms and further details of the posts may be obtained from the undersigned.

Latest date for receipt of applications for the posts in social work and statistics is Friday, 8 April, 1983. Latest date for receipt of applications for the post in Chemistry (Analytical) is Friday, 29th April, 1983.

M. F. Kelleher, Secretary



PERMANENT SECRETARY

Applications are invited for appointment as Permanent Secretary to the Association which represents the interests of and provides services to, the 70,000 student members of the Open University.

The Permanent Secretary is responsible, through the President, to the National Executive Committee of the Association and ultimately to National Conference, for the provision of advice and administrative support to the President of the Association and its committees in the development and implementation of Association policy; management of the Association's financial affairs, including its marketing operations; and management of the Association's staff of fourteen based in Milton Keynes.

Weekend commitments are frequent; compensating time off can be taken during the week.

Candidates should have had considerable experience in administration and management, preferably in higher, further or continuing education.

Salary will be at an appropriate point on Admin. Grade III (£12,920-£16,180) and the appointee will be eligible for membership of USS.

Further particulars may be obtained from The President, Open University Students' Association, Sherwood House, Blenheim MK3 6HN.

The closing date for applications is 22 April 1983.

For full information about conditions of employment, visit the website at: <http://www.open.ac.uk>

University of London

General Certificate of Education Examinations

The Council invite applications for the following appointment:

Moderator from August 1983

HISTORY

Applicants should be graduates of, or hold appropriate qualifications and should be under 55 with five years recent teaching experience at school, college or University level. Examining experience essential.

For application forms and further details write to The Secretary, University Entrance and School Examinations Council, University of London, 99-101 Gower Street, London WC1E 6BT. Applicants should enclose a self-addressed, returnable envelope. Completed application forms should be returned by 30 April 1983.

For further information write to the Secretary, University of London, 99-101 Gower Street, London WC1E 6BT.

University of Strathclyde

STAFF OFFICER (GRADE IV)

Applications are invited from those with appropriate experience and qualifications for the new post of Staff Officer (Grade IV) for the University of Strathclyde.

The post holder will be responsible for the administration of the University of Strathclyde and will have the responsibility of ensuring that the University of Strathclyde is fully represented in the University of Strathclyde.

Applicants should have a minimum of five years' experience in the field of administration and be able to teach at University level. The post is available from 1 September 1983. Salary: £12,000-£14,000 p.a. (inc. pension).

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For further information write to the Secretary, University of Strathclyde, 100 Cathedral Street, Glasgow G1 1QU.

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SOUTH EAST THAMES REGIONAL HEALTH AUTHORITY AND UNIVERSITY OF KENT AT CANTERBURY

LECTURER IN MANAGEMENT/ MANAGEMENT TRAINING ADVISER

This is a new limited appointment funded by the RHA to provide a high level of knowledge and expertise to the management training programme within the Region. The successful applicant will be involved in the evaluation and redesign of programmes, and as appropriate, will provide some tutorial input.

The person appointed will also take part in teaching and research in the field of Management in the University of Kent at Canterbury.

The post represents a unique opportunity to link an academic research approach to management and management training with the practical reality of applying management at all levels in a very complex organisation to do this job.

Applications are invited from those holding a qualification in occupational psychology or management studies and experience in management training. Some experience of management in the NHS would be an advantage.

The appointment will be for a period of five years commencing as soon as possible. Salary will be on the NHS administrative scale 9 (£2,567-£10,277) NHS Terms and Conditions of service will apply.

Application forms and further particulars may be obtained from Mr. J. E. Kelly, Senior Assistant Registrar, The Registry, The University, Canterbury, Kent, UK. Tel: 01843 246111. Appointment letter will be issued on receipt of a 20p stamped addressed envelope (10" x 8"). Completed application forms (5 copies) should be returned not later than Monday 18th April, 1983. Please quote reference number A653/THES.

For further information write to the Secretary, University of Strathclyde, 100 Cathedral Street, Glasgow G1 1QU.

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Universities continued

UNIVERSITY OF ZIMBABWE

Applications are invited for the following posts:

PROFESSOR OF MECHANICAL ENGINEERING

The successful applicant must have a first degree and higher degree in Mechanical Engineering with extensive research, teaching and industrial association. The appointee will be required to take on a major role in the development of undergraduate and postgraduate work within the Department and to pursue research in his/her area of particular interest. Consultancy is encouraged.

Salary within the Professional range, Present Professional average £19,405.

Nine copies of applications, quoting Reference L261/A, should be submitted, not later than 22 April 1983, to the Establishment Officer, University House, Bulawayo, Lancaster LA1 4YW, from whom further particulars may be obtained.

For further information write to the Secretary, University of Strathclyde, 100 Cathedral Street, Glasgow G1 1QU.

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Universities continued

University of Exeter
Department of Biological Sciences
TEMPORARY LECTURER

Applications are invited for the post of Temporary Lecturer in Biochemistry. The post is for three years in the first instance. Salary (under scale) depending on qualifications. The range is £5,500-£7,000 p.a. plus 10% membership.

Further particulars obtainable from the Personnel Office (Appointments), University of Exeter, Hatherly House, Exeter EX4 4JF, to whom applications and enquiries should be sent. Closing date: 15 April 1983.

University of Oxford
ADMINISTRATIVE OFFICER

Applications are invited from graduates for appointment in scale 1A of the Administrative Structure (£2,850-£11,085).

The work will initially involve a range of administrative activities and will develop into a more complex role with staff responsibilities. The successful candidate will be expected to undertake a range of administrative work in the Department of Biological Sciences.

Further particulars may be obtained from the Deputy Registrar (Administrative), University of Oxford, 100 Wellington Square, Oxford OX1 2JG. Closing date: 15 April 1983.

University of Essex
Department of Languages
SENIOR LECTURER

Applications are invited for the post of Senior Lecturer in the Department of Languages. The post is for three years in the first instance. Salary (under scale) depending on qualifications. The range is £5,500-£7,000 p.a. plus 10% membership.

Further particulars obtainable from the Deputy Registrar (Languages), University of Essex, Wivenhoe Park, Essex, S10 2BP. Closing date: 15 April 1983.

Polytechnics

North Staffordshire Polytechnic
Faculty of Computing, Humanities and Education
PRINCIPAL LECTURER

Applications are invited for the post of Principal Lecturer in the Faculty of Computing, Humanities and Education. The post is for three years in the first instance. Salary (under scale) depending on qualifications. The range is £5,500-£7,000 p.a. plus 10% membership.

Further particulars obtainable from the Deputy Registrar (Computing), North Staffordshire Polytechnic, Stoke-on-Trent ST4 4DA. Closing date: 15 April 1983.

SENIOR LECTURER GRADE II IN COMPUTING

Applications are invited for the post of Senior Lecturer Grade II in Computing. The post is for three years in the first instance. Salary (under scale) depending on qualifications. The range is £5,500-£7,000 p.a. plus 10% membership.

Further particulars obtainable from the Deputy Registrar (Computing), North Staffordshire Polytechnic, Stoke-on-Trent ST4 4DA. Closing date: 15 April 1983.

Applications are invited for the post of Senior Lecturer Grade II in Computing. The post is for three years in the first instance. Salary (under scale) depending on qualifications. The range is £5,500-£7,000 p.a. plus 10% membership.

Further particulars obtainable from the Deputy Registrar (Computing), North Staffordshire Polytechnic, Stoke-on-Trent ST4 4DA. Closing date: 15 April 1983.

Applications are invited for the post of Senior Lecturer Grade II in Computing. The post is for three years in the first instance. Salary (under scale) depending on qualifications. The range is £5,500-£7,000 p.a. plus 10% membership.

Further particulars obtainable from the Deputy Registrar (Computing), North Staffordshire Polytechnic, Stoke-on-Trent ST4 4DA. Closing date: 15 April 1983.

PAISLEY COLLEGE

A Scottish Central Institution

DEPARTMENT OF MATHEMATICS AND COMPUTING

LECTURESHIPS (2 posts)

The lecturing of the department is to degree, honours degree and post-experience courses and includes a wide range of studies in the application of these disciplines to the business and management sciences and to economics.

Applications are invited from well-qualified candidates for the following posts:

STATISTICS

Candidates should have specific interests in the application of statistics to at least one of the above areas.

OPERATIONAL RESEARCH/ MODELLING

Candidates should have experience in developing mathematical models in industry or commerce and an interest in relating that experience to undergraduate teaching.

The successful appointees will be expected to undertake research and consultancy in a relevant area.

Salary Scale: Lecturer 'A' (£7,986 to £12,561) (to be reviewed from 1st April 1983)

Application forms and further particulars are available from the Personnel Officer, Paisley College of Technology, High Street, Paisley PA1 2SE. Tel: 041-827 1241, Ext. 230, to whom completed forms should be returned by Monday 28 March.

Lecturer 'A' in Home Economics

£7,986-£12,561

(Post Ref: 83/6)

Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

THE QUEEN'S COLLEGE GLASGOW

A Scottish Central Institution

Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

DUNDEE COLLEGE OF TECHNOLOGY

Applications are invited for two newly-created posts in the Department of Mathematics and Computing Studies.

SENIOR LECTURESHIP

Applications should possess a postgraduate qualification in an appropriate discipline and have recent research and/or teaching experience in the field of information technology.

Further particulars obtainable from the Deputy Registrar (Mathematics), Dundee College of Technology, Dundee DD1 1HG, to whom applications should be sent by 1 April 1983.

MIDDLESBROUGH POLYTECHNIC

Applications are invited from graduates with good Honours degrees in Education, Psychology or other Social Sciences to undertake research in the field of educational psychology.

Further particulars obtainable from the Deputy Registrar (Education), Middlesbrough Polytechnic, Middlesbrough TS4 1BA, to whom applications should be sent by 1 April 1983.

Applications are invited from graduates with good Honours degrees in Education, Psychology or other Social Sciences to undertake research in the field of educational psychology.

Further particulars obtainable from the Deputy Registrar (Education), Middlesbrough Polytechnic, Middlesbrough TS4 1BA, to whom applications should be sent by 1 April 1983.

Strathclyde Department of Education
GLASGOW COLLEGE of TECHNOLOGY

Glasgow College of Technology, a Polytechnic Institution of HE, invites applications for the following posts:

HEAD OF DEPARTMENT OF MANAGEMENT STUDIES (Grade 15)

The Department is involved in a wide range of courses at undergraduate, postgraduate and post-experience levels. Applicants should have relevant academic and professional qualifications as well as appropriate management experience in industry or commerce.

SENIOR LECTURER 'A' - LEARNING SYSTEMS

The Learning Systems Advisor carries responsibility for the development of learning and teaching systems and resources. Applicants should have a postgraduate qualification in a relevant discipline and experience in the development of learning systems.

Application forms for the above two posts from the Establishment Officer, Glasgow College of Technology, Cowcaddens Road, Glasgow G4 0BA. Tel: 041-327 1000. When applications should be returned within 14 days of the appearance of this advertisement.

Further particulars obtainable from the Deputy Registrar (Management Studies), Glasgow College of Technology, Cowcaddens Road, Glasgow G4 0BA. Tel: 041-327 1000.

PLYMOUTH COLLEGE OF TECHNOLOGY

Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

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Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

Colleges of Technology continued

Camborne School of Mines

Temporary LECTURER II/ SENIOR LECTURER

in Mining Engineering

A two-year appointment in the first instance (and possible renewal) for a young graduate with a mining degree and considerable interest and experience in the application of computers to the solution of mining problems.

Excellent computing facilities are available to back up the strong research and teaching activities at the School. This is a "development post" and the successful applicant will need to be highly motivated and enthusiastic.

Apply in the first instance to: The Registrar, Camborne School of Mines, Pool, Redruth, Cornwall TR15 3SE, from whom further particulars may be obtained.

Closing date: 31st March 1983.

Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

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Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

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Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

GLOUCESTERSHIRE COLLEGE OF ARTS AND TECHNOLOGY
INFORMATION TECHNOLOGY PROGRAMME

The College, with bases in Cheltenham and Gloucester, is contributing to the rapid expansion nationally of advanced courses in Information Technology, an area in which provision for full time and part time students is already extensive.

The following new posts will be offered to suitably qualified and experienced candidates:

1 PRINCIPAL LECTURESHIP (Computing Studies)

7 SENIOR OR GRADE II LECTURESHIPS (Computing Studies)

1 SENIOR OR GRADE II LECTURESHIP (Statistics and Operational Research)

1 GRADE I LECTURESHIP (Computing Studies)

1 GRADE II LECTURESHIP (Associated Management Studies)

Application forms and further details are obtainable from Administrative Officer (Staffing) GLOCAT, Oxstalls Lane, Gloucester. Tel: 0452-26321.

Informal enquiries may be made to Mr P. Davey, Mathematics and Computer Studies at Park Campus, Cheltenham (0242-28021).

Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

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The closing date for this post is Monday, 18th April, 1983.

Roehampton Institute

Courses offered by the Roehampton Institute of Higher Education are in combined studies leading to university first and higher degrees. The Institute seeks to make the following appointment in the Department of Business Studies for a FIXED-TERM period from 1 September 1983 to 31 August 1984.

LECTURESHIP IN ECONOMICS

A graduate in Economics, preferably with a higher degree, is required to assist in the teaching of foundation and applied economics courses at undergraduate level on Business Studies degree.

Salary (L1/L2 scale) £8,855-£12,816 plus London Allowance £938 per annum.

Further particulars and application forms may be obtained by writing to: R. A. Fennell, Assistant Secretary, Roehampton Institute of Higher Education, Richardson Building, Digby Street College, Roehampton Lane, London SW15 5PH. Closing date for applications: Wednesday, 20 April 1983.

Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer, Staffing, at the address or telephone number below.

The closing date for this post is Monday, 18th April, 1983.

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Applications are invited from graduates in Home Economics or a related discipline who have industrial, research or teaching experience.

Further particulars are available from The Secretary and Treasurer

Research & Studentships continued

University of London The London School of Economics Business History Unit SSRC RESEARCH LINKED STUDENTSHIPS

Three postgraduate studentships will be offered in the Business History Unit. The research programme is a study of research for a Ph.D. degree within the field of the history of business. The research will be carried out under the supervision of a senior member of staff. This year preference will be given to candidates proposing to work on the history of business in the period 1800-1900.

Applications are also invited for a Ph.D. degree in the field of post-1900 business history. This year preference will be given to candidates proposing to work on the history of business in the period 1900-1950. Details of the programme and application procedures are available from the Graduate Admissions Office, London School of Economics, 25 Abchurch Lane, London EC4A 3DF. Applications should be sent to the Graduate Admissions Office, London School of Economics, 25 Abchurch Lane, London EC4A 3DF. Telephone: 01-459 3338, ext. 204.

Librarians

Royal Borough of Kingston upon Thames Directorate of Education and Recreation (re-advertising) PRINCIPAL LIBRARIAN OFFICER

£13,590-£14,035 plus essential user car allowance

This new post within the Directorate of Education and Recreation is responsible for the effective management of the Library Service throughout the Borough. The Council now seeks an experienced and motivated individual to fill this post.

Application form and further details for this post are available from the Directorate of Education and Recreation, Kingston upon Thames, Surrey, TW20 0EX. Tel: 01-846 6132 ext. 3310.

All previous applicants are considered automatically. Closing date: 28th April 1983.

UWIST University of Wales Institute of Science and Technology Library ASSISTANTS (2) (TWO YEAR APPOINTMENT)

Applications in writing are invited for the posts of Library Assistant. The successful candidates will be required to work in the University Library, Cardiff, and to assist in the management of the library's collection of books, journals and other materials.

Applications and CVs to be sent to the Director of Library Services, University of Wales, Institute of Science and Technology, Cardiff, CF1 1AA.

Overseas continued

McGill University Canada TENURE-TRACK APPOINTMENT AT THE ASSOCIATE PROFESSOR

Applications are invited for a tenure-track appointment at the Associate Professor level in the Department of History. The successful candidate will be responsible for teaching and supervising graduate students, and for contributing to the research and publication activities of the department.

Industry & Commerce

Lecturer Broadcast Television Industry

Sony Broadcast Limited is a world leader in the professional broadcast television industry. As part of a comprehensive service to customers, our technical training centre provides operational and in-depth courses on a wide range of products which include video tape recorders, cameras, editing control systems, and professional audio equipment. The department has excellent lecturing facilities together with a technical publications department and library. Further expansion is planned to extend our training activities and applications are now invited for the position of Lecturer.

The successful applicant will conduct theoretical and practical courses on our range of equipment. Applicants should be educated to honours degree level electronics and possess the ability to present ideas clearly. Previous lecturing experience would be an advantage, although the interview process will concentrate on identifying candidates with significant technical capacity and the potential to achieve in this thoroughly challenging environment. Training on our range of products and in lecturing skills will be given where appropriate.

We offer attractive salaries and first class conditions of employment. If you are interested please write with full career details to: Mike Jones, Senior Personnel Officer, Sony Broadcast Limited, City Wall House, Basing View, Basingstoke, Hampshire RG21 2LA. Telephone Basingstoke (0256) 55011



Sony Broadcast Ltd.
City Wall House
Basing View, Basingstoke
Hampshire RG21 2LA
United Kingdom
Telephone (0256) 550 111

TQ Project Manager International Training Projects

TQ International specialises in equipping training laboratories worldwide, and is the UK's largest manufacturer of dedicated engineering training equipment. The TQ Special Projects Group is now expanding to develop the co-ordination of all activities relating to development of these facilities, from building design through curriculum preparation to preparation of audio visual material.

A Project Manager is now required to provide a major input to the promotion and development of the successful division of TQ International Limited. Applicants should be:

- Enthusiastic, adaptable, and hard working
- A graduate in a technological subject, possibly with a Ph.D., aged 25-40
- Experienced in Training, Industry or International Business - or a combination of these
- Able to work on their own initiative - especially overseas
- Keen to travel
- Preferably fluent in French, Arabic or Spanish.

We are keen to hear from younger graduates of high ability who may perhaps be working in academic situations at present and who believe they have the potential for this kind of work.

Initial salary negotiable according to ability and experience. All normal benefits, including removal allowances if appropriate. Future prospects excellent, depending on the success of the division.

Initial applications in writing to: Mr E. A. Neville, Technical Director, TQ International, Bonhill Street, Long Eaton, Nottingham NG10 2AN. Tel: 06076 62611.

DIRECTOR OF EDUCATION CHARTERED SOCIETY OF PHYSIOTHERAPY

Required from September 1983 to be responsible for the overall coordination of all aspects of the Society's educational activities including a clearing house for entry to training, the monitoring of programmes within 35 schools of physiotherapy, the provision of a system of postgraduate education.

The Society's policy is to evolve towards an all-graduate profession and to explore opportunities for professional development compatible with the need for a high standard of service to patients.

EDINBURGH DUNFERMLINE COLLEGE OF PHYSICAL EDUCATION POST OF VICE PRINCIPAL

Applications are invited for the above post which will become vacant on 1 September 1983. Applicants should have appropriate administrative experience and should be knowledgeable about recent developments in the fields of physical education, recreation and sport.

Salary for the post will be £18,288. Further information and forms of application for the post may be obtained from the College Secretary, Dunfermline College of Physical Education, Cremona Road North, Edinburgh EH4 6JD, to whom completed applications should be returned by 8 April 1983.

Awards

THE GUILD OF ST. GEORGE Founded by John Ruskin ACADEMIC AWARDS 1983-84 Research Awards in Design History

Applications are invited for research funding in the field of Design History. Further information and application forms are available on receipt of s.a.e. from Anthony Harris, Master of the Guild of St. George, c/o Chelsea School of Art, Manresa Road, London SW3 6LS.

The closing date for applications is Friday, 29 April 1983.

Overseas continued

UNIVERSITY OF MALAWI STAFF VACANCIES: CHANCELLOR COLLEGE Department of Geography and Earth Sciences Lecturers in Physical and Social Geography (3 posts)

1. Applicants for the one post in Physical Geography should have a higher degree with teaching experience and research interests in either (1) economic, population, or agricultural geography, or (2) history and philosophy of geography. Some knowledge of remote sensing will be an advantage. There are opportunities for research.

2. Applicants for the two posts in Social Geography should have a higher degree with teaching experience and research interests in either (1) economic, population, or agricultural geography, or (2) history and philosophy of geography. Some knowledge of remote sensing will be an advantage. There are opportunities for research.

A competitive salary will be offered at a level commensurate with qualifications and experience.

Part-time accommodation will be provided. Applications (4 copies) with a detailed curriculum vitae containing full particulars of qualifications and experience, plus the name and address of three referees, should be sent to the University Registrar, University Office, P.O. Box 278, Zomba, by 31st March, 1983.

KING FAISAL UNIVERSITY HOFUF, SAUDI ARABIA SOME ECONOMIC SECTION to teach girl students in the following disciplines:

- Child Development and Family Life
- Home Furnishing (Interior Design) and Housing
- Home Management and Family Finance
- Clothing and Textiles
- General and Organic Chemistry
- Sociology and General Economics

Prerequisites: appropriate qualification and minimum of two years' teaching experience at university level. Classes are taught in Arabic.

Benefits include furnished housing, air tickets to and from Saudi Arabia once per year, 60 days paid annual leave, generous luggage overweight allowance, No Saudi tax.

Salaries are highly competitive and negotiable. Contracts are for one year and renewable.

Please send complete curriculum vitae, quoting ref. FAME with current telephone number and the names and addresses of three referees to:

Dr. Tahia Maki
c/o I.K. Recruiting Office,
King Faisal University,
89 Belgrave Square,
London SW1X 8QR.

Overseas continued

UNIVERSITY OF JOS NIGERIA

Applications are invited from suitably qualified candidates for the following vacancies in the University:

Department of Mathematics
Professors (Specialisation in Numerical Analysis an advantage)
Senior Lecturers/Lecturers in Fluid Mechanics.

Department of Architecture
Professors/Readers
Senior Lecturers/Lecturers

Department of Building
Professors/Readers
Senior Lecturers/Lecturers

Department of Religious Studies
Lecturers/Assistant Lecturers
(Arabic and Islamic Studies)

Senior Lecturers/Lecturers

Department of Property and Commercial Law
Senior Lecturers/Lecturers

Candidates for positions in Department of Architecture must have the experience and ability to teach at least four of the following courses:

- History of African Architecture
- Building Materials
- Building Construction
- Urban Design
- Climate and Design
- Landscaping Design
- Contract, Building Law and Ethics
- Industrial Design
- Interior Design
- Housing Design
- Graphic Communication
- Restoration and preservation of buildings of architectural and historical interest.

Candidates for positions in Building Department should specialise in any of the following areas:

- Land Surveying
- Quantity and Cost Planning
- Soil Mechanics and Foundation Engineering
- Building Technology and Building Construction
- Candidates to the Faculty of Law, should specialise in any of the following:

- Commercial Law
- Equity and Trusts
- Company Law

Salaries
Professor US\$ 16 (N14,280 x 720 - N16,720)
Reader US\$ 14 (N12,732 x 680 - N16,372)

Senior Lecturer US\$ 13 (N11,364 x 678 - N14,820)
Lecturer I US\$ 11 (N8,000 x 360 - N10,080)
Lecturer II US\$ 9 (N7,650 x 204 - N8,040)
Assistant Lecturer US\$ 8 (N6,336 x 192 - N7,488)

These posts are training posts for Nigerian graduates only.
Note: N1 = .80p approximately.

Conditions of Service
Appointment on either permanent terms until retiring age, in the case of Nigerian candidates, subject to a probationary period, or on two-yearly contract, renewable by mutual consent. Economy-class air or first-class sea passage for appointees, wife and up to 5 dependent children at beginning and end of contract. Part-time accommodation at rental of 8% of basic salary to maximum of N300 p.a. or rent allowance in lieu. Contract addition of 25% of basic salary, leave allowance, car loan, car basic allowance.

Method of Application
A typewritten copy of application including full curriculum vitae stating Name in full, date of birth, nationality, permanent and current address and telephone number, full details of qualifications and experience with names of institutions and dates, detailed list of publications with date and names of journals, the names of three referees who know you professionally.

Candidates resident in Europe and the United Kingdom should send their application not later than 22nd April, 1983 to:

The Director
Nigerian Universities Office
100 Tottenham Court Road
London W1P 0LE

In United States of America:
Nigerian Universities Office
1333 New Hampshire Avenue, N.W.
Suite 220
Washington, DC 20036

In Canada to:
Nigerian Universities Office
160 Kent Street, 7th Floor
Ottawa, Ontario,
Canada

In Middle and Far East to:
Nigerian Universities Office
2nd Floor, 18-19 Street
Mohandessin
Cairo, Are

Please request referees to send their references to respective Nigerian Universities Office.

Lecturers Polish and Russian

There are two posts for suitably qualified language teachers, one in Polish at RAF North Luffham in Leicestershire, and one in Russian at the Army School of Languages, Beaconsfield, Bucks.

The successful candidates will be required to teach Polish or Russian respectively, with particular emphasis on the appropriate military and technical terminology, in all types of courses run by the respective establishments to which they are appointed; and to be responsible for, or to assist in, the selection and production of teaching material and the design of courses.

For the post in Polish candidates must have a native or bilingual knowledge of Polish, and should preferably also have some knowledge of Russian.

For the post in Russian candidates must have a native or bilingual knowledge of spoken and of modern literary Russian.

For both posts candidates must have a high level of proficiency in spoken and written English. They should preferably have a degree or an equivalent qualification in the language they are offering, experience of teaching that language to English-speaking students, and a teaching qualification.

SALARY: As Lecturer Grade II £8020-£12895 (Burnham scale, including a pensionable allowance of 17% of salary for longer working years). Starting salary within the range according to qualifications and experience. An additional allowance of £246 for the post at Beaconsfield.

For further details and an application form (to be returned by 13 April 1983) write to Civil Service Commission, Alencon Link, Basingstoke, Hants, RG21 1JB, or telephone Basingstoke (0256) 68591 (answering service operates outside office hours). Please quote ref. G/5197.

Ministry of Defence

REMINDER
COPY FOR CLASSIFIED ADS
SHOULD ARRIVE NOT LATER THAN
10AM MONDAY PRECEDING PUBLICATION

UNIVERSITY OF NATAL DEPARTMENT OF AFRICAN STUDIES

Durban, South Africa

Applications are invited from suitably qualified persons regardless of sex, religion, race, colour or national origin for appointment to the post of

PROFESSOR

This is a newly created post of a full Professorship of Comparative African Government within the Department of African Studies. Applicants should have appropriate qualifications in one or more of the social sciences relevant to the study of contemporary governmental forms and processes in Africa. They should also have a demonstrated ability to conduct and promote research. An interest in regional and local government would be an advantage. The successful applicant would be expected to assume duty from the 1st January 1984, or as soon as possible thereafter.

Salary in the range: R22,109 - R30,255 per annum.

The commencing salary notch will be dependent on the qualifications and/or experience of the successful applicant. In addition, a service bonus of 93% of one month's salary is payable annually.

Application forms, further particulars of the post and information on pension, medical aid, group insurance, staff bursary, housing loan and subsidy schemes, long leave conditions and travelling expenses on first appointment are obtainable from the Secretary, South African Universities Office, Chichester House, 278 High Holborn, London WC1V 7HE or the Registrar, University of Natal, King George V Avenue, Durban, 4001, with whom applications on the prescribed form, must be lodged not later than 16th May 1983 quoting the reference D23/83.

LEBANON American University of Beirut

5 Assistant Professors
Department of Business Administration
(Reference 83 A 26-30)

3 Assistant Professors
Department of Chemistry
(83 A 31-33)

The American University of Beirut is a leading cosmopolitan English medium university. Founded in 1863 in West Beirut in a campus of 70 acres, it now has 4,500 students, male and female, from all over the Middle East. Throughout recent disturbances in Beirut it has continued to function almost normally retaining a significant proportion of expatriate staff. It has asked the British Council to assist in recruitment in the UK for British staff to augment their Faculty as from the 1983 Academic year.

Duties: 5 Assistant Professors, Department of Business Administration, Teaching Specialty: (a) Marketing - Marketing Management, International Marketing, Marketing Research, (b) Accounting - Basic Accounting, Cost Accounting and Control, Auditing, Advanced Accounting, (c) Banking - Commercial Banking, Central Banking and Monetary Policy, (d) Business Economics and Statistics - Managerial Economics Quantitative Methods, Business Economics Statistical Methods - Business Research, Analysis and Forecasting, Business Statistics, (e) Finance - Financial Markets and Institutions, Financial Management, Investment. 3 Assistant Professors of Chemistry, Teaching Specialty: (a) Analytical - Instrumentation - General Chemistry, Quantitative Analysis, Analytical Chemistry, Technical Analysis, Instrumental Techniques, (b) Inorganic - General Chemistry, Inorganic Chemistry (Lecture and Laboratory Courses), Co-ordination compounds, Inorganic Preparations, (c) Physical - Spectroscopy - General Chemistry, Chemical Kinetics, Molecular Structure Chemical Thermodynamics, Advanced Laboratory.

All appointees will also teach graduate courses according to ability and demand. Extra curricular activities (eg athletics coaching) are welcomed.

Qualifications: Candidates, male or female must have a PhD 1 or 2 year post-Doctoral experience is desirable. The upper age limit is 60 years. Some knowledge of Arabic would be useful but not essential.

Salary: US\$27,000-US\$27,000 per annum, taxable (£13,038-£17,801 at £1 = 1.5340).

Benefits: A1 to 4 bedroom University flat (rent free), free telephone, free heating and hot water for campus housing; provided; free heating and hot water for campus housing; minimum air fares and baggage allowance for appointees and family (children under 18 years); Educational and out-of-pocket allowance; entitlement to enrol in AUB Hospitalization Insurance Plan; 3 summer months annual leave; A 1 year contract, renewable particularly for those able to arrange secondment, is available but 5 year contracts preferred.

Starting date: late September 1983.
Applications should reach us by 8 April 1983 if possible.

For further details and application form, please write quoting the post reference number to: Overseas Educational Appointments Department, The British Council, 90-91 Tottenham Court Road, London W1P 0DT.

THE BRITISH COUNCIL

University of the Witwatersrand Johannesburg Department of Zoology LECTURER

Applications are invited from suitably qualified persons for the post of Lecturer in Zoology, for appointment to the above post.

Applications will be welcomed from persons qualified to teach zoological methods and techniques, and to conduct research in zoology. A knowledge of laboratory statistics would be an advantage.

The Department offers courses in zoology and related subjects at both undergraduate and post-graduate levels.

The salary will be in the range of R15,000-17,500 per annum, depending on qualifications and experience. The successful candidate will be required to teach and to conduct research in zoology.

Candidates should have administrative and counselling experience, knowledge of American and Spanish academic systems and fluent Spanish.

Salary is about \$8,500 per annum, plus good benefits. Detailed job description is available.

Send C.V. and names of two referees by 1st April 1983 to:

Mark Simpson
American Institute for Foreign Study
37 Queens Gate
London SW7 5HH
Tel: 01-581 2732

THES Special Features for 1983

June 10 Reviews of New Journals
in the Humanities and
Social Sciences.

June 17 Computers in Higher
Education

August 12 Feature to commemorate
the 13th Commonwealth
Universities Congress.

Sapt 16 Reviews of New Journals
in the Sciences.

Don's diary

Monday

Berger and Luckmann and the sociology of knowledge first thing today - but as this is a so-called "integrated" course, I sit with the students while my colleague talks. It's always pleasant not to be quite the one in charge. Each week as I sit down I rediscover with a little shock of recognition that view of mills, Pennines and sky opposite me, forgotten since last time. I've just driven through it, but it looks remote and awe-inspiring from here. I keep careful track of the lecture though, ready to intervene occasionally, to suggest the sort of appalled comments Plato might have offered on this notion of reality-construction, regarded as an ineluctable norm. . . . Sometimes, moments of extraordinary inter-disciplinary illumination occur; at other times (just as illuminating really) we want to cry with astonishment at one another: "So that's how you use the word 'knowledge'!", or "moral education", or "autonomy" or whatever. No wonder we didn't understand one another! And the disorientations, when near-axiomatic certainties suddenly slip, under the impact of an alternative perspective. . . . I've come to realize that a lot of the time, though it's important that we get the students oriented, first. And these are undergraduates, unlike most of my students, who are mature adults, either preparing for, or already in, some branches of FE or HE.

Then down to our other site to discuss teaching practice, and to photocopy an article on the split brain I'm sending off to Texas. Afternoon meeting of a BEd committee. Once again, that (apparently hyper-real) life outside the window tempts me. But the sense of things speaking and understanding one another, an occurrence not so common in the groves of academe - is absorbingly interesting. I phone students in schools of nursing to arrange teaching practice visits.

Tuesday

Write again to student who disagreed with my assessment, returning essay, re-marked by a colleague who produces, without conferring, comments almost identical to mine, but a lower grade than I gave. Perhaps the least satisfactory aspect of my undoubtedly rewarding job is assessing the work of highly motivated and hard-working people, and sometimes appointing them. I hate it. But myself seek criticism from others, struggling over the years to extinguish personal pride in these matters, and being obsessively anxious just to learn; and I try to promote that attitude in other people. All the same, I know with every fibre of me what this student feels, and I try to respond accordingly. Spend afternoon working on a paper I (in common with other participants) am supposed to be presenting at a Philosophy of Mind "colloquium" in Dubrovnik in a week's time. Topic: "Mental Events". Reading Donald Davidson, I seem eventually to discern the traces of his somewhat laborious progress through the topic - as though he'd stopped and started, rather. It's good stuff, of course. That evening, at a philosophy seminar at Leeds University, someone unkindly compares his work with William Burroughs' "cut-up" novels. As an impression, not too far off. Said seminar an exercise in the absurd. Not having read the title properly, I now find it is on malice, magical logic Dedekind and Russell, infinities, and others - "German and English infinities" as the speaker drolly observes. He is a youngish German professor. There is another joke in the paper: if you say you're a finitist, you can be asked, "which of the infinitely many types of finitist

are you?" I understand that bit. Otherwise I (and apparently most others) are hopelessly lost.

Wednesday

To a school of nursing to sit in on a lesson. I haven't been here before, so leave home very early and then read Fodor in the car park as I imagine long journey shrinks to just the actual miles it is. Wherever I go into staffrooms of various kinds round here, familiar faces of ex-students greet me, but from the wrong novel, as it were. I make for more of the surreal, more slip between the commonsense world and the peculiar one I seem to live in. Contexts change people dramatically - shrinking, stretching, squashing, brightening them or whatever as in dream, or life after death. The lesson goes routinely, efficiently, clinically; then (on the subject of lumps and tumours) the tutor suddenly breaks right through the protective impersonality: "What do people - what would you - feel though about finding such a thing in yourself?" The words "fear", "death", "love" reverberate: something odd happens; it is as though everyone goes hot and cold at the same time. Then, with exquisite empathy, the tutor pulls them (and me) out of it; later, the human side of all this will be dealt with more fully.

Thursday

Rousseau this morning: I'm always trying to penetrate through to the meaning of it all - to show how so many everyday assumptions about education - or about life too for that matter - rest on theoretical positions. You do that, you can nail the assumptions. . . didn't Keynes utter his threnody over long-dead economists to that same effect? Yet it hardly matters where you start - it's where the lesson ends up that counts. Then to find another school of nursing, and again that turning of the imagined place into the peculiar actual: another staffroom, but in a different place on the corridor from yesterday's. Going out, what floor am I on? Which town is this, now? Today I'm hypothyroidism, somehow made really interesting by pure enthusiasm for knowledge, and by the tutor's interest in her students' minds.

Friday

Today I lecture in York all day. Last week it was horribly foggy, now transformed. I say lecturing, but it's all questions, in what I hope is the right order: the class members, lecturers from all kinds of professional background, trade and expertise, do the rest. We discuss training, deskilling, behaviourism. Skinner and Chomsky, my dog. People throw up wonderful ideas: a rhythm of tightness is established. I walk at lunchtime, and get lost in a ploughed field. All afternoon, bits of drying mud fall off my shoes as I pace up and down the classroom. I get the impression that people are watching them, as the room gets hotter; as though they will remember them; as actual pity-gritty world among the concepts that float around the room. Travelling home, I discover a new short cut down two motorway flyovers proportionately pleased; a week of wildly assorted places, faces, minds resolves into harmony: as my boomerang-shaped route somehow links up everything, including the wandering roads, after all.

Peter McKenzie

The author is a senior lecturer in education at the vocational education department of Huddersfield Polytechnic.

Thanks to federal legislation, America's colleges and universities find themselves for the first time since Vietnam enmeshed in a dispute about "the draft". The United States has no military draft in effect, but the law requires all males born after January 1, 1960 to register with the selective service system within 30 days of their 18th birthday. The nation wants to be ready to draft young men should legislation be passed.

So far approximately 96 per cent of those required to register have done so, but the resisters make headlines out of proportion to their numbers. Some have been hauled into court for failure to comply with the law. As of now the major constitutional questions (if indeed there are any) have not been settled by the courts. Initial resistance, however, forced the Congress to require each university student seeking financial aid from the government, whether in the form of loans, grants, or work study grants, to submit proof that he was registered with the selective service system.

Officials in the Department of Education and in the selectors' service system have to draw up rules and regulations to govern the implementation of the law. The Congress instructed both agencies not to lay heavy administrative burdens on the nation's colleges and universities, but it is impossible to avoid such burdens given the size of the task.

Reactions across the nation have been varied and unpredictable. The Quaker colleges were the first to declare that they would make up out of their own funds the federal aid lost by any student who could claim that his reasons for refusing to register were based upon conscience. Yale University early on claimed that it would make up out of its own funds any loss due to a refusal to register for the draft. The president of Boston University said that citizens who were unwilling to shoulder the burden of democracy had no right to expect to share its benefits, and Boston University therefore would deny even its own aid funds to those who have not registered for the draft. Most of the nation's colleges, conscious of the legal implications of too policy a stance, have kept their heads down.

Big is dutiful if you merge to save neck

If I copy *THESE* leaders and talk about polyversities and amalgamations, I apologize. My life is so full of them at the moment. I've been shuttling back and forth to Belfast to produce a report on the new and so far nameless university institution which the Government hopes will get in the Six Counties. (It's been covered, eight or even nine counties, but we'll have to see about that.)

In a fortnight, Edwin Parkes and Christopher Ball are coming side by side, holding hands, to the Select Committee to tell us about their warm and effective cooperation in the planning of higher education courses across the board. Or at any rate in agriculture and architecture courses - I wonder how long it will take them to get round to zoology. In London, the site is full of quirky schemes for amalgamated satellite campuses to the North-East and West. Not South. Philadelphia: south of the river is central to any understanding of the capital. The University of Coudoun or Orington Polytechnic are simply unthinkable concepts. So it's all go, and it's right to survey the landscape.

In doing so, I have, that funny feeling that I've come this way before. In the 1960s, when we had visions of the whole Western world developing like one vast affluent California campus, there was wide-spread talk of polyversities, and they were identified as a "good" not unlike the Ford Cortina, not unlike Hoovermads to which in principle all should have access.

Then it all suddenly folded fast. I've alluded to institutional education and the Black Papers related to the educational system. University became a word, a concept, a selective and we seemed to be settling back

Getting ready for a fresh draft



Timothy Healy

The congressional intent that onerous burdens should not be laid upon the colleges, is flouted in legislative demands that "verification" be furnished by the college itself. The easiest verification would be a copy of the student notice received from the selective service board when he registered. That, however, does not take into account students who have lost the letter, those to whom it has never been sent, or those who simply forgot to bring it with them. Procuring a delayed letter could take months, and many colleges are not willing to gamble their slender financial aid funds on its arrival.

At the moment the colleges, through their umbrella organization, the American Council on Education (ACE), are trying to qualify the regulations to eliminate or reduce the burdens of verification. At the same time the ACE has appealed, with some sympathetic hearing, both to the Senate and House of Representatives, to hold off implementation of the new regulations until matters are clearer, and until the colleges are in better administrative shape to take on the new draft.

At the moment the colleges, through their umbrella organization, the American Council on Education (ACE), are trying to qualify the regulations to eliminate or reduce the burdens of verification. At the same time the ACE has appealed, with some sympathetic hearing, both to the Senate and House of Representatives, to hold off implementation of the new regulations until matters are clearer, and until the colleges are in better administrative shape to take on the new draft.

Christopher Price

into the familiar old, meretricious landscape in which some of us were brought up in the 50s. Now, suddenly, we're talking about polyversities again. Is it a trick?

The short answer is: "Yes, of course it is." The current talk of amalgamation is not inspired by the remotest vision of a brave new world. It's all about cuts: cuts in Northern Ireland, cuts in London, cuts in Scotland. The easiest way to anaesthetize the pain of killing one institution is to pretend that it's part of another. Kill a department or a faculty, and no-one will notice. Take over a whole institution, the Archbishop of Canterbury has done, and before you know where you are, you know where you were. Before East London Polytechnic would be knocking on the door. My Select Committee report, two years ago, suggested that a university or two might slip into the poly sector. But that's not going to happen.

So I see the granting of a charter to the minuscule "University of Buckingham" as the end of an era, not the beginning of one. Tiny, free-standing places are not in fashion. I would lay hands on that within a decade or two. Buckingham will be knocking at the door of Oxford University, or even that Open one at Milton Keynes - begging admission. I also lay a handy bet they'll get it.

The Robbins matrix of little Redbrick calls, opening in our

Whenever Congress sets out to spank universities, it is fair to ask "why?" The hostility of government to academics is not something new to the twentieth century. England has a long history of town and gown clashes from which American colleges could well learn. On the other hand, the last 30 years in the United States have seen the kind of government academic animosity that has been both heady and helpful. Hard cases make bad laws and so do hard times. During the past three to four years, relationships between the nation's universities and their governments have, in put it mildly, turned fairly sour. A grinning and almost barefaced politician is at work in many of the federal organizations that touch higher education.

The most blatant example of this has been the administration's removal of any one of liberal credentials from the guiding committee of the national institute of education, or from the environmental protection agency's review panels. The administration has proposed massive cut-backs in student loans. There is growing ambiguity about the nation's commitment to basic research at a time when industrial and commercial sources of research funding have been significantly reduced by a weakened economy.

Finally, there has also been a growing reluctance in government councils to face the nation's still unfinished agenda to provide equality of access to higher education for previously neglected ethnic and racial minorities. It seems that little of this can be laid on the doorstep of the president himself. As governor of California, Ronald Reagan was a strong supporter of higher education; both public and private colleges and universities emerged stronger and more fully supported after his eight years in the state house.

All the same, the nation's commitment to research, to equality of access and to freedom of choice has slowed seriously. Conservatives seem instinctively to distrust the academy. Emerson's comment that intellect cancels fate may hold for an individual faced with the grim reality. When intellectuals come in colleges, their ability to cancel fate may depend on the politicians who fund it.

cathedral cities, acorns from which great oaks were meant to grow, never quite came off. Essex and Sussex and East Anglia know it. There is, on the university side, a predictable desire to keep hold of nurse, or at any rate to be cooperative with their new male nurse, Sir Peter Swanton-Dwyer.

I suspect that is all just a reversion to the traditional, federal university norm. I discover from my Irish archaeological researches that the Macraes Magee College of Arts and Dialects, of the Presbyterian Church of Ireland, sensibly took refuge during the nineteenth century in the Royal University of Ireland, of which Queen's University was once a constituent part. One big umbrella, a cosy comfortable federation encompassing the weak and the strong is the tradition of Wales, of California - even of Oxford.

Moreover, in all those transitory polyversity marriages at present with the brokers, there's an added incentive for the colleges to join the university club because the evaluator invariably goes upward. Mr Bidey, the vice-chancellor designate the new situation in Ulster, has already said: "The University of Ulster", even before the charter was written.

If, in London, City Polytechnic ever got into bed with City University, or if they both got into bed with Queen Mary College, the same incentive would be there; and before you know where you were, North London Polytechnic would be knocking on the door. My Select Committee report, two years ago, suggested that a university or two might slip into the poly sector. But that's not going to happen.

So I see the granting of a charter to the minuscule "University of Buckingham" as the end of an era, not the beginning of one. Tiny, free-standing places are not in fashion. I would lay hands on that within a decade or two. Buckingham will be knocking at the door of Oxford University, or even that Open one at Milton Keynes - begging admission. I also lay a handy bet they'll get it.

LETTERS TO THE EDITOR

Standards of achievement and provision

Sir, - In addition to being a recent chairman of the Committee of Polytechnic Directors and a member of the board of the National Advisory Body, Dr Raymond Rickett's record of innovation is second to none. Therefore, we hesitate to question his views. However, we must beg to differ from his approach to the unit of resource which he expressed in his recent letter (*THESE*, March 4).

It is a fact that the elected representatives of our society seek to divert expenditure away from higher education to areas which they regard as having greater priority. This is not a passing phase but a policy which is likely to continue for some years to come. Nor is it likely that a change of administration would benefit higher education although the order of priorities would not be the same. Whether it is defence, the social services, 16 to 19-year-olds, or adult education that receives the highest priority, higher education must face the prospect of a continuing decline

in resources in the short and medium-term future.

Dr Rickett assumes that standards of academic achievement can be related directly to standards of provision. Of course, there must be some truth in that assumption but it is not the whole truth. It leads inevitably to the corollary that if resources fall then the only way to maintain standards is to reduce the number of student places. If this is intended to spur the middle classes into rallying around the universities and polytechnics then it has been notably, and sadly, unsuccessful. They are agog with indifference.

The education service is far from perfect and there is always some scope for reducing the unit of resource without an unacceptable reduction in academic standards if appropriate ways can be found for realizing those reductions.

We are sure that Dr Rickett shares our belief that education - and especially higher education - is beneficial

to individuals who are able to take advantage of it, as well as to the community at large. We believe that those benefits should be extended to as many people as the system can accommodate. Therefore our policy should be to offer the best possible educational opportunities to the maximum number of suitably qualified people within the given, available resources. We should now look for changes in teaching methods and modes of working which would alleviate some of the effects of falling resources. We need, not to bury our heads in the sand but, to set our sights on the even greater challenges which lie in the not too distant future.

Yours sincerely,
W. K. ALLAN,
Deputy Director,
Academic and Resource Planning.
S. J. RICHARDSON (Mrs)
Principal Lecturer in Sociology
City of Birmingham Polytechnic.

Korean studies

Sir, I'm frankly puzzled as to why my Don's Diary on Korea should have provoked such an outburst from Dr Skilled (*THESE*, March 11). Were I so minded, I suppose I should find its tone quite offensive. But the content of what he says seems to connect so far at all with anything that I actually wrote, except to misunderstand it.

I can't think how he got the impression that I think that South Korea's approach to the tragedy of Korea's division in a "carnival spirit". Perhaps Dr Skilled is unfamiliar with the use of irony as a literary device. But no one else that I know has failed to get the message that I intended; which was of course an implied criticism of the South Korean government (by no means to be equated, as Dr Skilled seems to, with the South Korean people) for handling the fact of division in a way which effectively dehumanizes their fellow-Koreans in the north.

Dr Skilled further accuses me of "misrepresentation" of the Association for Korean Studies in Europe (AKSE). Most of what I in fact wrote about AKSE is either neutral or complimentary; the letter including, as readers may recall, a congratulatory reference to Dr Skilled himself on his election as president. It remains the case, however, that

AKSE's bias is (a) towards arts rather than social science, and (b) away from Korea's politically contentious present towards its more tranquil (at least in recollection) past history.

I note that Dr Skilled makes no attempt to respond to these points. He would in fact be hard put to rebut either of them, in as much as (b) represents his own view on the admittedly difficult question of how to pursue Korean studies in the context of Korea's political division. As for (a), I think that he effectively makes my point for me: not only in his account of the "range" of topics for next AKSE conference (from ancient history to morphemes) but above all in his own quite gratuitous denigration of the social sciences *per se* (in the penultimate paragraph of his letter).

Finally, lest your readers be left with an impression of the small (but burgeoning) field of Korean studies as wholly rent by such disagreements, I should add that the recently formed British Association for Korean Studies - in which both Dr Skilled and I are involved - already shows an encouraging trend towards the social scientific study of contemporary Korea.

Yours faithfully,
AIDAN FOSTER-CARTER,
University of Leeds.

Liverpool closures

Sir, - When Felicity Jones's report on Liverpool was published (*THESE*, March 4) it was already significantly out of date, and even more moving, with such rapidity (perhaps even decisiveness) that your story of March 11 still leaves a very incomplete impression of events.

The ban on recruitment had already been lifted on most of the 14 "list 6" courses before March 4, and in the case of the BSc building, the MSc shipping and transport, the BA law and the advanced nursing courses some 10 days earlier. "List 6" was never intended as "the latest list of course closures", and the closure of the courses mentioned above was never under consideration at all. Indeed, the chairman and deputy chairman of governors were persuaded of the wisdom of lifting the ban on recruitment on these courses only a matter of days after the ban was lifted from the other 31 courses.

Right of appeal

Sir, - I would like to add my voice to that of Professor Goldstein (*THESE* letters, February 4) in registering disquiet at the refusal of Hull University to allow a postgraduate student the right of appeal on academic grounds.

As a parent, I am made fully aware of my rights of appeal if the secondary school to which my son is allocated is not to my liking. As a former secretary to a CSB board, I can testify to the care with which appeals against grades are handled and to the publicity given to the appeals procedure. At the Open University, those candidates unfortunately should not reach the standard required by the higher degree

The problem of meeting financial cuts has been a matter of serious debate at Liverpool Polytechnic for a lengthy period. The difficulties in decision-making, which your correspondent reports, should be viewed in the context of the enormity of the task. Historically, Liverpool Polytechnic has been one of the lowest cost institutions. When the AFE pool was "capped", this low income level was perpetuated. The local authority (where no political party has had a working majority for years) has decided not to meet the shortfall. Savings in the order of 1 in 3 academic jobs are required. Decision-making in such circumstances can hardly be other than agonized.

But the grief of the relatives is not softened by false reports that more members of the family have died.

Yours sincerely,
PROFESSOR B. S. JACKSON,
Head of Department of Law,
Liverpool Polytechnic.

AUT poll

Sir, - As the member of the Association of University Teachers principally concerned with commissioning the recent Gallup poll about public attitudes towards higher education, I take great exception to the aspersions cast in your leader (*THESE*, March 11) about the accuracy of the figure of 60,000 students who will be denied a place in higher education in the three years 1982-1985. These figures were in fact given in an answer to a Parliamentary question (Hansard, written answers March 16 1982, Col. 74) by the very same William Widdowson who has been boasting about the increase in the age participation rate. The truth is that the minister says one thing in Parliament and another thing on the wireless and at meetings at Central Hall. A simple phone call to the AUT could have elicited this information and saved the embarrassment of your leader writer.

Yours sincerely,
BILL STEPHENSON,
Senior Vice-President,
Association of University Teachers.

Keele finances

Sir, - *THESE* on March 4 carried an article on an accountant's report on the financial position of this university commissioned by the Association of University Teachers; the report was carried out by Arthur Andersen and Co. The article, and particularly its attendant headline, implied that the university had "dismissed" the Andersen report out of hand. This is simply not true. In addition, the university is doing its utmost to move to the lower staffing establishment required by the University Grants Committee by voluntary means. The Andersen report is a constructive one and we are confident that it will receive a constructive response as it is discussed with the university.

Yours sincerely,
DR DAVID VINCENT
President, Keele AUT
DR DAVID HARRISON
Vice-Chancellor
University of Keele.

Irish cartoon

Sir, - I am Irish, and a graduate of Trinity College. I was not amused by the cartoon accompanying your report on the industrial action currently taking place there (*THESE*, March 4). Perhaps I should explain that when you are Irish you get more than a little fed up with being caricatured as drunken sub-humans. I have come to expect such treatment from certain elements of the "popular" (academic) teaching and student press and alleged comedians, but finding it in *The THESE* came as something of a surprise and a disappointment.

Yours sincerely,
ROISIN BATTEL,
25 Montserrat Road,
Putney, London SW15.

Letters for publication should arrive by Tuesday morning. They should be as short as possible and written on one side of the paper. The editor reserves the right to cut or amend them if necessary.

Grants for social work

Sir, - During a recent debate in the House of Lords, a revolt by back benchers on the Government side led to a provision for mandatory grants for all Certificate of Qualification in Social Work courses being incorporated into the Health and Social Services and Social Security Adjudication Bill. The Bill is now before the Commons and the Government has given no indication of its final attitude on this new clause.

If the new provision remains in the Bill, it will help to solve the currently highly ambiguous and confused situation relating to grants for training in social work. The CQSW is a uniform qualification for all social workers, whatever avenue of entry they follow, yet the financing of students is remarkably diverse especially for the non-graduate courses. In many of these courses we may find students in receipt of funding from the Home Office (for probation training), local authority sponsored trainees, students on i.e.a. discretionary grants, and self-financing students. On some postgraduate courses Department of Health and Social Security funded students may be added to these. The demand for qualified social workers has hardly diminished in spite of cutbacks in local authority spending, yet there is no consistent arrangement for funding the students. What has been cut back is employer sponsorship which has now very largely been replaced by discretionary grant from education authorities. This rather undermines the Government's argument about the cost of making these awards mandatory. The real increase in cost would be the expensive process of selecting students who do not take up their places because of grant problems. Another major gain would be the removal of the very considerable anomalies and injustices that arise from the ways in which local authorities interpret their

Yours sincerely,
C. R. AKHURST,
Joint University Council for Social and Public Administration, Bristol Polytechnic.

Trans-binary trips

Sir, - Your editorial on the possibility of transbinary movements ended with the statement "The best approach is probably a softly, softly policy that creates a permissive atmosphere to encourage transbinary exploration but without too many heavy ideological preconditions" (*THESE*, March 4).

The Government expenditure White Paper shows that the proportion of higher education funds devoted to polytechnics and other maintained higher education establishments has significantly reduced while their student numbers have increased both relatively and absolutely. Recent indications are that local authorities are unlikely to provide any funding for their maintained institutions other than that from the pool, with the result that the 10 per cent cut originally envisaged by the National Advisory Body is likely to finish nearer to 15 per cent.

The only transbinary exploration which is likely to prove meaningful at the present time would be one report on the industrial action currently taking place there (*THESE*, March 4). Perhaps I should explain that when you are Irish you get more than a little fed up with being caricatured as drunken sub-humans. I have come to expect such treatment from certain elements of the "popular" (academic) teaching and student press and alleged comedians, but finding it in *The THESE* came as something of a surprise and a disappointment.

Yours faithfully,
JOE POWELL,
Chairman, Association of Polytechnic Teachers.

Union View

Education as a matter of opinion

The opinion poll business must surely rate as one of our steady growth industries as we move towards the last 12 months of this Government's term. Bermondsey behind us, Darlington (and Cardiff North West?) yet to come.

The Association of University Teachers took the unprecedented step recently of commissioning an opinion poll on the public's attitude to expenditure on education.

Our was carried out on our behalf by Gallup. The sample population was asked what they thought of the Government's spending policies in a number of different areas, including roads, the National Health Service, and defence, as well as education.

An impressive 72 per cent of respondents thought that little was being spent on education; 6 per cent thought too much, 17 per cent thought it was about right and 5 per cent were don't knows. Furthermore, 69 per cent disagreed with the Government's policy of cutting higher education places in order to reduce expenditure (and 77 per cent of those under 44). And more than 80 per cent thought that all adults and young people over 16 who had reached the required standard, should have sufficient Government financial support to enable them to continue or take up appropriate education or training (11 per cent disagreeing, 8 per cent don't know). These are interesting results, especially when set against the findings of *The Sunday Times*/MORI poll of November 1981 which covered similar ground. Then, 60 per cent were against cutting spending on universities (30 per cent for), and 58 per cent were against cutting student grants (29 per cent for). Even allowing for the differences in the surveys, which mean they are not directly comparable, there seems to have been a discernible shift in public opinion since 1981. Most particularly pro-uts opinion has shrunk from a significant minority to one in every 20 or so. On the other hand, nine out of 10 now feel that matters have gone far enough and most think, much too far.

Views on defence spending present a stark contrast. Virtually half (49 per cent) the respondents thought too much was being spent on defence, only 13 per cent thought too little. But it's not necessary to rely solely on the sensitive and controversial area of defence spending to argue that people do mind about the construction in opportunity the cuts in education financing have caused. Education as a priority area has a respectable rating in comparison with such traditionally popular cornerstones of the welfare state as the NHS and pensions. Our survey suggests that education is now level pegging in the public mind with these as deserving more, not less money. In fact a greater level of satisfaction with present levels of Government spending was recorded for the NHS and pensions, compared with education, while the substantial majorities believing too little is spent on these were 71 per cent and 64 per cent respectively.

It is to be hoped that politicians of all parties will take notice of the fact that there are signs the issue of education opportunities is becoming one of significance to the electorate. Our responsibility now is to keep this issue firmly before people of all ages in the months ahead. It is, after all, the quality and quantity of the opportunities which schools, colleges, polytechnics and universities will be allowed to offer them, which is at stake.

Tina Day

The author is assistant general secretary of the Association of University Teachers.

AUT